# THE IRON AGE

**A Review of the Hardware, Iron, Machinery and Metal Trades.**

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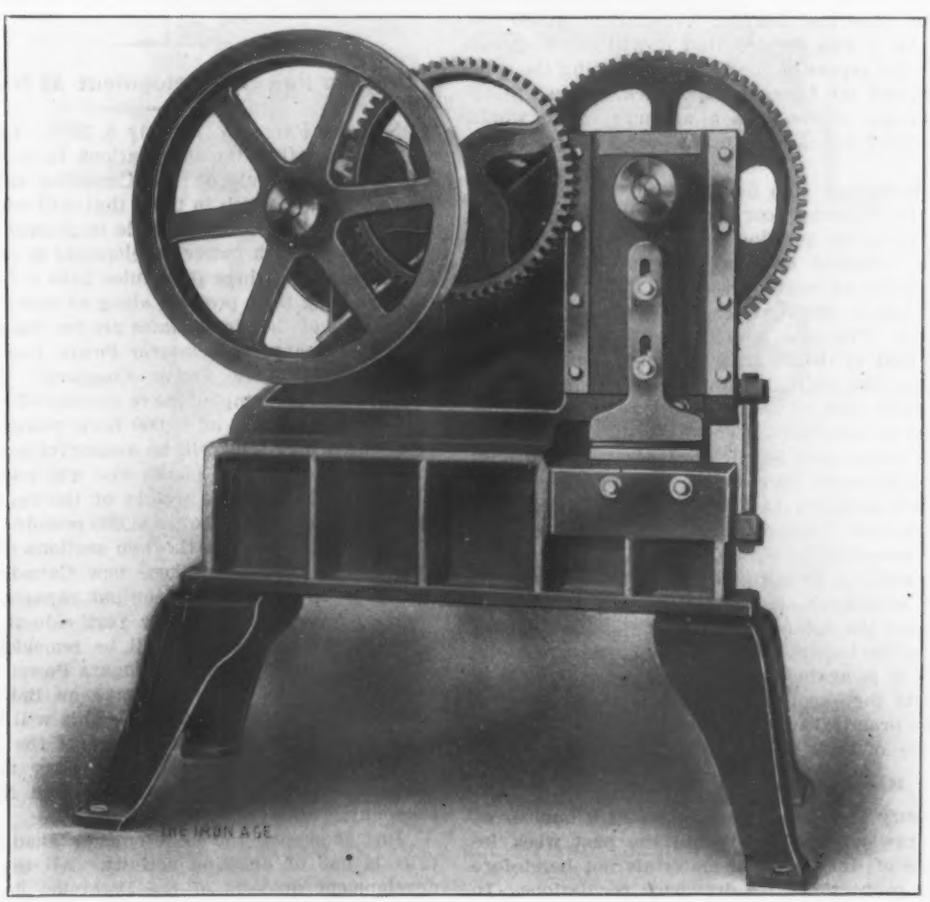
# THE IRON AGE

THURSDAY, MAY 14, 1903.

## The Young Sheet Metal Power Shears.

The W. C. Young Mfg. Company of Worcester, Mass., are getting out a new line of power shears for boiler makers' use and for other similar work, designed for cutting off or splitting sheet metal of any width. These shears are intended for heavy use and are radically different in design from the shears previously manufactured by the company. The machine is double geared, the ratio of gearing being about 1 to 20. The gearing is worked with a friction clutch. The machine carries a 10-inch blade and is made in three sizes, to handle sheet metal ½, 9-16 and ⅝ inch in thickness. The 9-16-inch size, shown in the cut, weighs 3200 pounds. The machine




THE YOUNG SHEET METAL POWER SHEARS.

is offset for splitting, so that the metal passes through freely. The bolt shown in the cut at the mouth of the shears, which gives additional rigidity to the machine, is removed when splitting is to be done.

## The Omega Steel Company.

The Omega Steel Company have been formed recently, with a capital of $3,000,000, to take over the National Tool Company of New Haven, Conn. About five months since the attention of Charles J. Benham, president of the Hamden Mfg. Company, manufacturers of auger bits, was called to a specially treated steel. Mr. Benham gave it a thorough series of tests in the bit shop of the company. A small threading tool was made with which they had thus far not been able to get more than five bits without sharpening. The Omega steel tool cut 38 pieces without the slightest injury and without sharpening. One of the machines in the shop was turning wood at 1400 revolutions a minute, and yet when cast iron was substituted for wood at the same speed the lathe tool ran across the piece of cast iron three times at ⅛-inch feed, 135 per minute. These tests led to the organization of the National Tool Company, whose business of making lathe and planer tools, dies, twist drills, taps, reamers, &c., grew very rapidly. The result was that increased facilities became necessary and it was decided to organize the Omega Steel Company, whose officers are Charles J. Benham, president; Charles Hudson of New Haven, Conn., vice-president; Robert Dunlop, New York, secretary, the other directors being George W. Nock, chief engineer of the Rockwell Engineering Company, New York; Dwight Blakeslee, New Haven, Conn; Charles Hudson, New Haven, Conn., and Frank Bayless, New York.

At a recent meeting of the directors it was decided to erect a steel plant, which will probably be located in Pennsylvania, this plant to be equipped with the latest machinery. Another tool shop similar to that in New Haven will be started in Boston, employing, like the New Haven shop, about 35 skilled workmen. It is expected that a third shop of the same description will be installed in the Chicago district. The main office at present is at New Haven and a branch office has been established at 7 and 9 Warren street, New York.

For tracings that require much handling, linen bond paper is the best medium. It is as transparent and much thinner than common tracing cloth, but the sheets are smaller. It is indestructible, apparently.

## The Lovering Drawback Bill.

### Recent Progress in the Movement for Its Passage.

WASHINGTON, D. C., May 12, 1903.—The Manufacturers' Committee, organized to promote legislation tending to liberalize the drawback laws, has been especially active of late, and substantial progress has been made in several directions. The attention of manufacturers of iron and steel, especially, is being drawn to the desirability of the passage of the so-called Lovering bill, in view of the high cost of domestic materials in this industry, and much interest has been aroused in the pending measure.

Very important progress in this campaign has recently been made among shoe and leather manufacturers, who are particularly anxious to extend their export trade. For several years an active movement has been on foot looking to the repeal of the hide duty, and certain leather manufacturers have withheld their support from the Lovering bill on the ground that the advocacy of that measure would militate against the prospect for the repeal of that duty. At the annual convention of the New England Shoe and Leather Association, which has just been held, it was decided that it will not be possible to secure the repeal of the hide duty during the coming Congress, and the Lovering Drawback bill was therefore unanimously indorsed as a measure which would bring much relief to manufacturers producing goods for export.

Another important step has been taken in the presentation in the Supreme Court, after much delay, of the issues involved in the question as to whether goods manufactured of imported materials are eligible to drawback when placed on board vessels in the foreign trade intended for use as ship's stores, but not designed to be landed abroad. The case which has been submitted to the court is that of the Swan & Finch Company *vs.* the United States, the claim involving duty paid on imported materials used in the manufacture of lubricating oils consumed on shipboard. The Lovering bill provides that all such stores shall be eligible to drawback of duty paid on their imported ingredients, and as the Swan & Finch case will probably be decided within a few days, the Manufacturers' Committee will soon be advised whether it is necessary to devote special attention to this section or to strike it from the bill. In either event it is believed that settlement of the case will help the Lovering bill. Should the decision be against the claimants, it will emphasize the importance of the early passage of the bill; while if it is against the Government, it will open up a new field for exporters and will attract much attention to the practical utility of the drawback laws and the desirability of their liberalization.

#### Recent Drawback Rulings.

The Treasury Department has prepared a number of interesting drawback rulings within the past week involving rebate of duty paid on materials not heretofore considered in connection with drawback regulations. In other cases regulations heretofore issued have been enlarged to embrace rebates on additional materials.

On the application of John R. Keim of Buffalo, N. Y., regulations have been issued allowing drawback of duty paid on imported steel balls used in the manufacture of bicycle pedals intended for exportation. The drawback entry must show the marks, numbers and dimensions of the shipping cases, the number of pedals contained in each case and the number of steel balls used in the manufacture.

Regulations have also been prepared upon the application of the Carborundum Company of Niagara Falls allowing drawback of duty paid on imported carborundum used in the manufacture of grinding wheels, sharpening stones, hones and carborundum paper. In liquidation the quantity of imported carborundum which may be taken as the basis for allowance of drawback may equal the quantity declared in the drawback entry after verification of the exported weights, but in no case shall the percentage of carborundum used in the manufacture of wheels and stones exceed 76.3 per cent. of the net weight of the exported articles, 48.8 per cent. of the net weight of exported carborundum paper and 44.9 per cent. of the net weight of carborundum cloth. To the net weight of each may be added 7.4 per cent. to cover the loss sustained in washing and preparing the crude carborundum for use in the manufacture of the various exported articles.

On the application of the Electric Storage Battery Company of Philadelphia drawback has been allowed of duty paid on imported lead and antimony used in the manufacture of storage batteries. It is provided that in liquidation the quantities of imported lead and antimony which may be taken as the basis for allowance of drawback may be those percentages specified in the manufacturers' sworn statement filed with the collector at the port of exit.

Regulations have been provided upon the application of the Cary Mfg. Company of New York for drawback of duty paid on imported sheet steel cut into strips and riveted together to form box straps. The drawback entry is required to show separately the net weight of coils of each size and gauge exported and that the merchandise was manufactured of materials and in the manner set forth in the manufacturers' sworn statement.

W. L. C.

## Canadian Power Development at Niagara Falls.

NIAGARA FALLS, N. Y., May 8, 1903.—Indications lead to the belief that the installations to be erected in the new power stations on the Canadian side at Niagara Falls will have much in them that will surpasses the installations of the American side in general interest. The Canadian Niagara power development is proceeding with great vigor, and three companies have a force of men at work rushing their projects along as speedily as possible. The names of these companies are the Canadian Niagara Power Company, the Ontario Power Company and the Toronto & Niagara Power Company. The Canadian Niagara Power Company have announced their intention to install generators of 10,000 horse-power capacity. In every particular they will be wonderful machines, wound for 12,000 volts, three phase, and will make 250 revolutions per minute. The weight of the revolving part of each machine will be about 141,000 pounds. As compared with the generators in the two stations of the Niagara Falls Power Company, these new Canadian generators will each have double the output capacity of the individual generators on the New York side of the river.

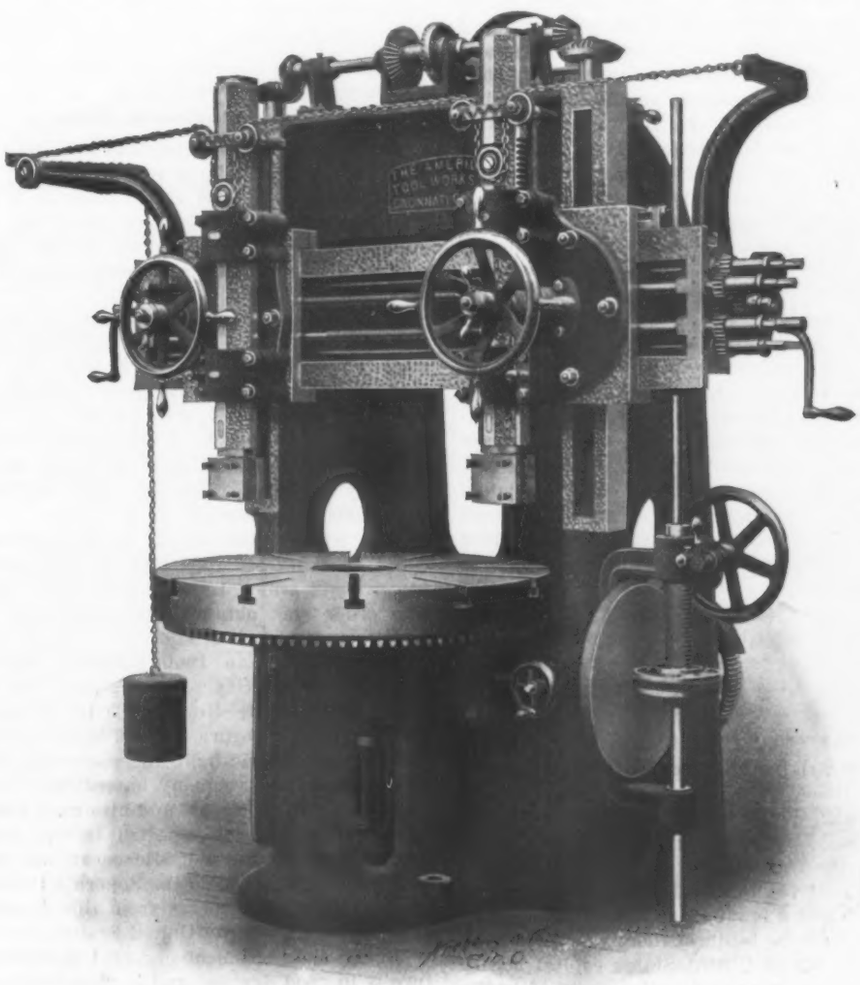
While these machines will be remarkable, it is announced that the Toronto & Niagara Power Company will install generators that will have an individual output capacity of 12,000 horse-power. This will be 7000 horse-power greater than the generators of the Niagara Falls Power Company and 2000 horse-power more than the generators to be used by the Canadian Niagara Power Company.

Just at present the scene on the Canadian side at the falls is one of amazing activity. All the other power development projects of the Dominion do not unitedly display the force that is to be developed at Niagara for the use of man. It would appear that the development must have a tremendous influence on the future of the Province of Ontario, if not on the entire Dominion. Even Niagara Falls, N. Y., with the markets of the United States at its command, and 13 years of experience in the use, transmission and application of power, does not show such energy of development as this now taking place in Canada. If the three projects now under way are carried to completion and the power used, new industrial conditions will be created, for it is clear that to use the energy present factories must change location or new industries be established.

W. G. Rowell & Co. of Bridgeport, Conn., are filling an order from the New York, New Haven & Hartford Railroad for 1000 aluminum bronze letters which will spell the railroad's name on new copper sheathed cars building at the works of the Wason Mfg. Company at Springfield, Mass.

## The Improved American Boring and Turning Mill.

The accompanying engraving shows the new 37-inch boring and turning mill just brought out by the American Tool Works Company of Cincinnati. The machine is given exceptional strength and rigidity by the fact that the entire frame is cast in one piece, consisting of bed, housing and top brace, and is of box form and thoroughly braced. The cross rail is of box girder form, with broad bearings, and is raised and lowered rapidly by power. The saddles are graduated in degrees, and are made right and left, so that the boring bars can be brought close together, if desired. The boring bars are of special hammered steel, octagonal in section, and the



THE IMPROVED AMERICAN BORING AND TURNING MILL.

racks by which they are operated are cut integral with the bar. They are perfectly counterbalanced and can be fed entirely independently of each other at any angle.

The table is 36 inches in diameter, is powerfully geared and has 16 changes of speed. The gearing on both table and pinion is accurately planed from the solid. The table spindle is of large diameter and extra length, and the thrust is taken on steel collars, hardened and ground. The feed is operated by a friction disk, with rapid adjustment, giving a range of from 0 to 5-16 inch vertical and 0 to 5-16 inch horizontal per revolution of the table.

The driving cone has four steps, the largest 18 inches in diameter, for 3-inch belt. The driving mechanism is at the back of the machine, avoiding liability to accident while putting on or removing work. The machine is self contained, obviating the necessity of expensive foundation.

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The high powered locomotives in use on many roads are giving much trouble by breakdowns. This extends to all parts of the machine—frames, cylinders, saddles, fire box sheets inside and details as well. The concentration of greatly increased strains from large cylinders and high steam pressures are producing a natural result, and larger factors of safety will have to be given. The *Railway Age*, in discussing this matter, says that records show cracked fire box sheets to be so numerous as to cause serious anxiety. The location is usually in the longitudinal length of the sheet near the bottom, and takes in a circle of about 3 feet diameter. The cracks are on the fire side and run vertically from one stay bolt to another. When tested in a machine the cracks open up alarmingly and the sheets also crack when punched, showing that the metal is thoroughly demoralized, so to speak. The cause of all this difficulty is not yet found, but various conjectures are advanced. Some think that the alkaline water they are obliged to use causes foaming to such a degree that the metal is laid bare and overheated. Whatever the reason may be, if it is not discovered and cured mastodonic locomotives will become unpopular.

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Hawkridge Brothers, steel merchants, 303 Congress street, Boston, Mass., have just completed a warehouse for the storage of steel. This is located near Boston on the line of the Boston & Maine Railroad, having a spur track running through the building. The dimensions of the building are 18 x 80 x 160 feet high. They propose to use this addition to their present warehouse, to enable them to carry heavier and more complete lines of steel than ever before, and in more numerous grades. They state that with the slow deliveries that the mills are giving them to-day it is impossible to supply their customers without their carrying very much heavier stocks than heretofore. They will have a storage capacity in their two warehouses now of more than 5000 tons.

# Notes from Mexico.

### Silver and the Railways.

DURANGO, May 5, 1903.—The commission which is struggling with Mexico's monetary question has circularized all the principal industrial companies asking for data in relation to their operations, and the effect which silver's decline has had upon the lines in which they are engaged. At the same time, as if to furnish an exhibition of indifference to the cogitations of financiers, the silver market and the exchange rate have been playing pranks of an acrobatic kind. Getting the impulse from London, silver took a steady upward turn some days ago which it has fairly maintained. Less than a fortnight ago exchange on New York was quoted at 264 and a fraction. It is now down to 220. The great difficulty which attends the transaction of business with gold standard countries, under these conditions, is obvious. Reference has been made to the losses suffered by the railway companies through the fall in value of the Mexican dollar. As, with very few exceptions, the railways of Mexico are owned by foreign bond holders, and the interest is computed upon a gold basis, while a large percentage of the operating and maintenance expenses are also paid for at gold rates while the earnings are in silver, it is plain that their position is peculiarly hard when the value is being clipped from the silver dollar from day to day.

Some impressive figures have been published showing the actual loss suffered by the Mexican Central Railway Company, the most important as well as the most enterprising and best managed system in the country. These figures demonstrate that, for eight years out of the past ten, the road has been operated at a loss despite its expansion and increased earnings. The other railways have presumably suffered proportionately. It is not surprising, therefore, that the railway companies should hesitate to make new extensions, or that they should chafe under existing conditions and view the future with foreboding. The wonder is that they have been so lavish in their expenditures. This of itself is evidence of their confidence in the wisdom and stability of the Government, and of their belief that when the monetary system of the country shall be placed upon a more stable foundation the losses of the past and the present will be recouped.

### Increase of Banking.

One of the most striking of the business developments in this country of quick transformation has been the extraordinary expansion of the banking interests. A little more than a decade has passed since the City of Mexico possessed very limited facilities in the way of financial institutions. The National Bank of Mexico, the Bank of London and Mexico and a few unimportant private banking firms transacted all the business there was to be done before the great inrush of United States capital began. To-day there are in the same city half a score of banks and trust companies with large capitalization, conducted upon the most modern system, which have their branches in all the principal cities. They are all prosperous and pay large dividends; indeed, it may be said that there are few more profitable lines of business in Mexico than that of banking. The laws governing it are strict, hence there is no wildcat recklessness in the management of these important institutions. Business men and humble depositors alike are undisturbed by fear for the safety of their hoards, while phantoms of absconding cashiers and stock gambling presidents haunt them not.

### Amendments to Mexican Patent Law.

An important measure relative to the patent and trade-mark laws has just been introduced into the Mexican Chamber of Deputies. Following is its text:

Article 1. Authorization is given to the Executive to amend the legislation on patents of inventions, trade-marks and other forms of industrial property along the following lines:

*a.* Trade-marks and patents will be granted without prior examination as to their novelty or originality.

*b.* The formalities through which applications for trade-marks and patents have to pass will be adjusted so as to be as expeditious and rapid as possible and the taxes on the titles of both will be made as low as possible.

*c.* A special and entirely adequate system of penalties will be established, to be applied to the persons who infringe trade-mark and patent rights, and to this end the articles of the penal code that may need be done away with will be repealed.

*d.* A registry of trade-marks will be established in the office having charge of applications therefor, so that transfers of ownership or other modification in the rights involved in the marks in question may be inscribed, without which said transfers or modifications will have no force against third parties. For this purpose the enactments of the code of commerce will be modified in order to harmonize said code with the laws in question.

*e.* A special system to encourage and stimulate the industrial exploitations in the country of useful inventions patented will be established by means of suitable provisions that will conciliate such exploitation with the exclusive right of operation which patents convey to their owners.

*f.* Without sacrificing the interests of industry and commerce, an effort will be made to adjust the laws to be issued to the principles most generally accepted in this respect in other countries so that they may with ease be made compatible with the convention of Paris of March 20, 1883, and subsequent modifications of said convention, in case Mexico should form part of the International Union for the Protection of Industrial Property.

Article 2. The Executive will report to the chamber as to the use made of this authorization.

### Industrial Notes.

The liquidators appointed by the shareholders of the Yucatan Electric Light & Power Company of Merida advertise tenders for the entire plant as a going concern. This plant was erected three years ago by Siemens & Halske of Berlin at a cost of 571,000 marks. The inventory of the company's property is placed at $1,032,000, Mexican currency.

The total gold value of the imports into Mexico during January of this year was $5,973,712.52, as compared with $5,128,257.93 in January of last year, an increase of $845,454.59. The total first given included machinery and apparatus, $635,690.18; vehicles, $99,313.71, and arms and explosives, $143,090.39. A comparison of the exports for the same month shows their aggregate value in Mexican currency as follows: January, 1902, $15,842,662.63; January, 1903, $15,679,389.57.

The Risdon Iron Works of San Francisco have secured an order for 2000 tons of steel pipe for a water power plant which is being built upon an inland river. The order was obtained in competition with Eastern manufacturers, so it is said.

The city of San Juan Bautista, Tabasco, is to be lighted by electricity. The contract for the plant has been given to Volte, Reyes & Castro, a firm of importers in the capital. Segura, Braniff & Co. of Orizaba, V. C., will furnish electric light and power for the nearby city of Cordoba. The company named have a Westinghouse electric plant at Orizaba, and also good water power.

A find of coal is reported in the neighborhood of Jiquilpan, in the State of Michoacan, and one of graphite near Willard Station, on the Sonora Railway, in the State of that name. Shipments from this deposit of graphite have been made to the United States.

Sugar making machinery of United States manufacture is in good demand and is considered superior to all other. Several complete plants have recently been installed in large plantations in different parts of the country.

It is announced from Monterey that the steel making department of the works there is about to be started. A number of orders are said to have been booked for steel beams and other products. The shares of the company have sold as low as $100, but they are again advancing.

Two new lines of steamships have been established between Mexico and foreign countries. One is the Hamburg and American Line, which has a fleet of first-class steamers carrying freight and passengers between European, Mexican and Cuban ports, the other being the Chinese Commercial Company's line, which consists of four steamers plying between Manzanillo, San Francisco, Hong Kong and other Oriental ports.

In addition to the order for rails recently noted as having been placed with a Philadelphia company, a Mexican paper reports that the same railway company, the Mexican Great Eastern, have ordered ten passenger coaches, 200 freight cars and five locomotives for early delivery.

Mexico's production of copper is steadily increasing. During the first seven months of the current fiscal year the exports reached the aggregate value of $11,231,235.18;

in the same period lead to the value of $3,371,371.00, and other metals valued at $658,445.77, were exported. These are silver values.

The rate of exchange for the payment of import duties for the month of May has been fixed at 243.90 per cent.

Imports from the United States during the first seven months of the current fiscal year were valued at $23,583,685.71, gold, an increase of $4,255,433.05 over the total for the corresponding period in the previous fiscal year.

Applications have been made to the Government for two new concessions for manufacturing plants. One is for a factory for making steel files, which is to be built in the Federal District: the other projected enterprise is a manufactory for generators for acetylene gas and for the production of carbides. Capital to the sum of $20,000 is to be invested in the first named undertaking, and $500,000 in the last.

The Mexican Central Railway Company, on account of the heavy growth of the traffic upon all of their lines, are considering the advisability of largely increasing their recently placed order for locomotives. J. J. D.

## The Production of Wire Rods and of Wire Nails.

The American Iron and Steel Association has issued the following:

The production of iron and steel wire rods in the United States in 1902 amounted to 1,574,393 gross tons, against 1,365,934 tons in 1901, 846,291 tons in 1900, 1,036,398 tons in 1899, and 1,071,683 tons in 1898, showing an increase of 208,459 tons, or over 15 per cent., in 1902 as compared with 1901. Of the total production in 1902, 1,574,187 tons were steel and 206 tons were iron rods. The following table gives the production by States in the last three years, in gross tons:

*Production of Wire Rods.*

| States.—Gross tons. | 1900. | 1901. | 1902. |
|---|---|---|---|
| Massachusetts, Connecticut, Rhode Island, New York and New Jersey | 134,502 | 176,101 | 201,653 |
| Pennsylvania | 240,533 | 386,037 | 509,802 |
| West Virginia, Kentucky, Alabama and Ohio | 244,731 | 422,679 | 440,538 |
| Indiana and Illinois | 226,525 | 381,117 | 422,380 |
| Totals | 846,291 | 1,365,934 | 1,574,393 |

Pennsylvania made the largest quantity of wire rods in 1902, with Illinois second, Ohio third, and Massachusetts fourth. Eight other States, Rhode Island, Connecticut, New York, New Jersey, West Virginia, Kentucky, Alabama and Indiana, also rolled wire rods in 1902. With the exception of West Virginia, which first rolled rods in 1902, all the States named also produced rods in 1901.

The following table gives the production of wire nails in 1901 and 1902, in kegs of 100 pounds:

*Production of Wire Nails.*

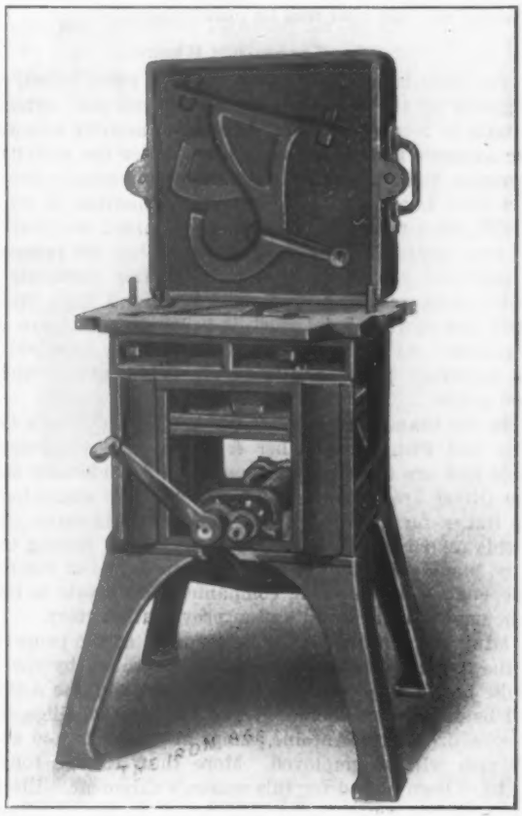
| States.—Kegs of 100 pounds. | 1901. | 1902. |
|---|---|---|
| New Hampshire, Massachusetts, Rhode Island and Connecticut | 71,553 | 309,651 |
| New York | 136,118 | 132,854 |
| Pennsylvania | 3,118,508 | 4,219,604 |
| Maryland, West Virginia, Kentucky, Alabama and Ohio | 3,633,894 | 3,251,918 |
| Indiana and Illinois | 2,716,748 | 2,902,006 |
| Michigan, Wisconsin and California | 127,001 | 166,213 |
| Totals | 9,803,822 | 10,982,246 |

The production of wire nails in the United States in 1902 amounted to 10,982,246 kegs of 100 pounds, as compared with 9,803,822 kegs in 1901, an increase of 1,178,424 kegs, or over 12 per cent. In 1900 the production amounted to 7,233,979 kegs, in 1899 to 7,618,130 kegs, in 1898 to 7,418,475 kegs, in 1897 to 8,997,245 kegs, in 1896 to 4,719,860 kegs and in 1895 to 5,841,403 kegs. The wire nails produced in 1902 were made by 62 works, as compared with 61 in 1901. The production in 1902 was greatly in excess of that of any preceding year. Almost all the wire nails produced in 1902 were made of steel.

**Protective Measures by Chicago Steam Users.**—The Steam Users' Association, which has recently been organized at Chicago, and of which Paul Blatchford is secretary, proposes to develop a policy by which the association will undertake to furnish men to occupy the places of strikers in the Chicago territory. The fact that men will be in readiness to take the places made vacant by union engineers and firemen may be a cure for hasty strikes. The members of the association wish it understood that it is not their intention to fight unions but to protect employers against loss and damage resulting from the arbitrary actions of the unions. It is the desire of this association to arbitrate any differences which may arise and to nip impending strikes in the bud. But to do this, the first essential is the possession of strength to counteract hasty and ill-advised actions of employees.

## The Lombard Molding Machine.

The N. A. Lombard Company of Worcester, Mass., are putting on the market a new type of molding machine, the invention of James Reid, Jr., superintendent of the Holyoke Machine Company. The latter company have 65 of



THE LOMBARD MOLDING MACHINE.

them in use in their foundry. The machine is simple in construction, as will be seen from the engraving. The raising and lowering motion is accomplished by means of two crank shafts, with two connecting spur gears. The pattern frame slides in two guides, and is also supported at each corner in a half circular slot, thus insuring rigidity. Compression springs counteract the weight of the flasks. The gears are covered to keep out the sand.

The Baltimore & Ohio Railroad has laid 1000 tons of nickel steel rail, 85 pounds to the yard, this spring, on curves where traffic is heavy. This rail, when experiments were being made, gave splendid results, the wear being much less than with the ordinary Bessemer steel. It is considerably harder and although expensive has demonstrated that it is economical in the end. In one test nickel steel was laid in 1897 and new Bessemer steel in 1898. In 1902 the latter had to be renewed, while the nickel steel appeared good for several more years of service.

## Lake Mining Matters.

DULUTH, MINN., May 10, 1903.—Examination is now being made by Eastern men, accompanied by dredge experts from Duluth, of the black ore sands of Lake Superior. On the north shore of the lake, in Canada, east of the Nepigon River, are deposits of these sands that seem to be of large size. It is the hope that they can be concentrated and shipped to furnaces. The ore is a magnetite, and when concentrated is said to be very pure and of good physical character. The parties interested have secured concessions from the Canadian Government that will permit their mining these deposits if it shall be found advisable to do so.

During April there were shipped through the Sault canals, covering the business of Lake Superior, about 650,000 gross tons of iron ore, out of 900,000 tons that went from the lake district. The total business of the canals for that month was 1,651,520 net tons of freight, compared with 2,340,000 tons for the same month last year, but far above any preceding April in the history of the canal. May will be an important month, and the shipments of ore and coal will be phenomenal.

### The Menominee Range.

The district just east of the Crystal Falls mines, running over by the Hope, Hollister, Hollister and Armenia, is liable to receive no little exploration activity this year. The Armenia has been looking well, under the activity of Corrigan, McKinney & Co., and this has brought the district into favor. The ore bearing formation is rather narrow, as a rule, and there is much mixed ore that has not been cleaned up. But development has not proceeded to sufficient depth to determine anything definitely, as explorations are conducted nowadays, and with greater depth and more careful work it is hoped that there may be results. At the Armenia indications are excellent for the discovery of ore bodies of much importance and of good grade.

In the Stambaugh district the Penn Iron Mining Company and Pickands, Mather & Co. have been optioning lands and are to explore at once on a considerable scale. The Oliver Iron Mining Company are also exploring at the Baker farm, to the northeast. The Hiawatha mine, in this district, the property of the Schlitz Mining Company, is understood to be under option to one of the large independent steel making companies, and a sale is liable to be made should examination prove satisfactory.

Mining operations are to be resumed at the properties of the Antoine Ore Company, now controlled by the Republic Iron & Steel Company. The output of the Antoine will be very much increased and the Vulcan silica is to be opened. At the Antoine pumps are at work and about 100 men will be employed. More than 100,000 tons of ore have been placed for this season's shipment. Electric power will be generated at Vulcan for the use of mines in that region, and preliminary steps have already been taken for the development.

### Water Power Improvements.

An important water power project is under consideration for Chandler Falls, Marquette range, by I. Stephenson and others, and another further up the Escanaba River, near Ishpeming, which is designed to transmit power to mines. The Lake Superior Iron Company own falls in this river and are supposed to have their improvement for mining uses in mind. On the Mesaba and Vermillion ranges there is every reason to expect that electric power will before long be delivered at the various mines, by reason of the operations of the Great Northern Power Company of Duluth, whose plans are fast reaching the point where actual construction will commence. The company will develop their immense power at Duluth from water falling 365 feet through pipes, and will transmit the power by wire to range points. They are under contract to be delivering power in little more than a year, and are now closing contracts for machinery and with construction companies.

### Explorations and Development.

For the past 15 months the Great Northern Railway Company have been employing both churn and diamond drills in the region west of the Mississippi River, along the trend of the Mesaba range, hoping to find a western extension of the range. Much of this work has been north of Grand Rapids, Minn., and west of there, though some has been on a possible western extension of the Vermillion range, north of Hibbing, Minn. Now all these drills have been withdrawn and work has ceased. It is understood that the company have been unable to find the indications they were looking for, though north from Hibbing they have found some quite encouraging indications. Attracted by the work of the Great Northern, many others have been prospecting these fields more or less carefully, but they are all coming out. There is to the west of the Mississippi River an extensive covering of drift over the formation, and it is a very costly and difficult matter to get down to ledge.

The Great Northern has let contracts for an extension of its line from the Hawkins mine, western Mesaba range, westerly to the Diamond mine, same range, a distance of about 10 miles. There are a few known ore bodies on the line of the road, but not many of good grade. The Diamond is the property of the United States Steel Corporation and now has no railway connection. It was purchased a few years ago as a reserve by the Oliver Iron Mining Company.

With the rapid development of charcoal furnaces in the upper lake region of late the annual consumption of wood is very great. It is stated that with the furnaces at Marquette, Gladstone, Manistique, St. Ignace and Newberry in operation as now, the annual consumption is more than 400,000 cords of wood. With the addition of the Sault furnaces the consumption will be very much increased, as these are among the largest charcoal furnaces built.

The latest report of the inspector of mines for Iron County, Mich., shows 1450 men employed at 16 mines and explorations. Of these Corrigan, McKinney & Co. have about 600 men, the Oliver Iron Mining Company 400 and other companies the remainder.

On June 24, this year, the Lake Superior Iron Company will hold a semi-centennial celebration of the beginning of work on their Ishpeming mines. It is expected that James Gayley and other leading Eastern officials of the company, as well as the Western officers from Duluth, will be present. An extensive programme has been made up for the occasion. The mines of the Lake Superior Iron Company have been in operation for half a century and in that time have produced 11,500,000 tons of ore, about the same quantity as those of the Cleveland Cliffs Iron Company, who held a similar celebration last year. The fact that both of these great companies are larger producers than ever, and have opened reserves for many years to come, is an interesting evidence of the permanence of the ore bodies of the old ranges of Lake Superior.

D. E. W.

**Great Railroad Strike in Australia.**—Employees of the State owned railroads of Victoria struck at midnight on May 8, in consequence of a dispute with the Government regarding the right to affiliate with the Victoria Trades' Hall, the headquarters of trade unionism in that colony. Before the strike began demonstrations were made in front of the newspaper offices. Troops were sent to patrol the streets. The Government claimed that in case of a strike in other trades affiliated with the Trades' Hall the railroad men would be obliged to strike in sympathy, and therefore the Government notified them that unless they withdrew from the Trades' Hall before May 12 they would be dismissed. The engineers retorted by demanding the withdrawal of the order by 5 p.m. on May 8. Those who went out will lose rights to pensions. Public opinion indorses the Government. About 11,000 men are out.

In 1840, or thereabout, Isaac Dripps, a master mechanic of the Camden & Amboy Railroad, designed a screw propeller which had the extreme tips of the blades flanged over the whole length in order to confine the water within the area of the wheel. No especial advantage was found in it over the straight blades used today, but it is a curious fact that this feature has been patented over and over again since.

## The Haeseler-Ingersoll Pneumatic Hammer.

The main features of the pneumatic hammer here illustrated are the valve mechanism for reciprocating the piston, a locking device for taking up wear and securely locking the handle, the valve box and cylinder made integral, and a simple arrangement of throttle valve for controlling the admission of air. The valve is axial, in that its movement is around a fixed axis or trunnion, the travel forward and back to alternately open and close the admission and exhaust ports being caused by a constant air pressure upon the short wing of the valve and intermittent air pressure upon the long wing. The parts in the valve, as well as those in the valve box, are of equal areas and are located diametrically opposite to each other, so that any pressure against either side of the valve is equalized by a corresponding pressure upon the other side, resulting in a balanced valve and consequent absence of friction and wear on the trunnion or axis about which the valve moves.

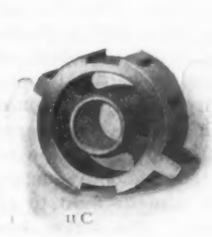


*Fig. 1.—Axial Valve.*

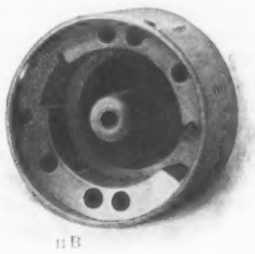


*Fig. 2.—Interior of Valve Box.*

As the movement of the valve is transverse to the direction of the travel of the hammer or piston, the vibration of the entire tool is lessened in operation, and the action of the valve is not disturbed when the hammer blow is struck, but is quick, steady and uniform, and entirely free from fluttering or incomplete travel. Both the valve and valve box are made of steel, hardened and accurately ground to gauges.

To insure keeping the joints between the faces of the cylinder, valve box and handle tight by securely locking the parts together, there is provided a simple and strong construction, consisting of a number of slots in the collar of the cylinder and a different number of notches in the end of the handle, the one number not being a multiple of the other. This arrangement permits a fine adjustment to be made when it is desired to take up the wear of the parts, as a notch in the handle will always be in line with one of the slots in the cylinder, without regard to any required position of the handle being necessary. When the handle is screwed up tight the parts are locked together by a key inserted in the registering slot and notch referred to, and this key is held in place by a spring band snapped over it and around the collar of the cylinder. The construction and operation of the throttle will be understood from the engravings, Figs. 3 and 4. These hammers are made by the Haeseler-Ingersoll Pneumatic Tool Company, 26 Cortlandt street, New York.

*Fig. 3.—Throttle Valve Closed.*

*Fig. 4.—Throttle Valve Opened.*

THE HAESELER-INGERSOLL PNEUMATIC HAMMER.

**New Steel Plant at Byesville, Ohio.**—The Cambridge-Byesville Steel Company are building a new plant at Byesville, Ohio, for the manufacture of open hearth steel, billets and bars, which they expect to have in operation about September 1. The plant will be modern throughout and will be equipped with the latest machinery, including a 35-ton open hearth furnace and billet and bar mills. Adjacent to the mill the company own a large tract of steam coal. C. L. Bailey of Marietta is president; Lakin C. Taylor, secretary, and A. A. Taylor, treasurer, both of Cambridge, Ohio.

The firm of Thomas Meadow & Co., English iron and steel manufacturers, have won the appeal which they made from an assessment of duty on soft steel strips used in the manufacture of electrical transformers. The strips were originally assessed for duty as manufactures of metal not otherwise provided for at 45 per cent. ad valorem. As this rate was practically prohibitive, the firm appealed to the General Board of Appraisers, who rendered their decision on May 6, in which they sustained the contention of the manufacturers that as the strips were valued at over 4 cents and not over 7 cents per pound, the proper rate of duty should be 1 3-10 cents per pound under the provisions of paragraph 135 of the Dingley tariff act. The statement is made that the firm have developed an important business in the manufacture of these strips for American use, and that they expect under a favorable rate of duty to greatly increase their exports of steel in this form to this country.

The Barnett & Record Company, contractors of Minneapolis, Minn., are erecting at Buffalo, N. Y., for the Washburne-Crosby Company a fire proof flouring mill and elevator of steel construction eight stories high and of large dimensions. The elevator will contain nine steel bound "tile" bins, each 90 feet high and 20 feet in diameter, a new feature in elevator and flour mill construction, patented by the Barnett & Record Company. The location is on the inner harbor, with lake, rail and canal connections, permitting grain to be received at the mill by boat, ground and distributed by rail or canal at a considerable saving in the cost of handling. It is quite probable that other milling interests at Minneapolis will follow the example of the Washburne-Crosby Company and establish on the water front at Buffalo—along the new harbor—flouring mills and distributing depots for the Eastern and European markets.

## The Tin Plate Workers' Convention.

ANDERSON, IND., May 7, 1903.—The fifth annual convention of the Tin Plate Workers' Protective Association of America ended to-day, after ten days' secret sessions. The officers were re-elected, with the exception of vice-president for the first district, and are as follows: President, George Powell, Wheeling, W. Va.; secretary-treasurer, Chas. E. Lawyer, Wheeling, W. Va.; vice-presidents, first district (Anderson), Martin Mooney, Anderson; second district (Newcastle), B. L. Bartlett, Newcastle; third (Pittsburgh), H. E. Barrett, McKeesport; fourth (Wheeling), Benjamin Teegarden, Martin's Ferry, Ohio; trustees: chairman, J. E. Elder, Newcastle; E. E. Katterhenry, Elwood; W. J. Madine, Pittsburgh.

Messrs. Powell and Lawyer have held their respective offices since the birth of the organization in 1898. Mr. Powell was then a tinner in the Newcastle plant and Mr. Lawyer was an opener in the Atlanta plant. They built up a strong organization, controlling 95 per cent. of the tin workers in the 275 mills of the American Tin Plate Company and all tin workers in the 125 independent mills. The association has a membership of 40,000. There are 44 local organizations. There has never been a general strike or lockout, notwithstanding that some serious questions have had to be faced. Secretary Lawyer says this record attracts the attention of other labor bodies and he is frequently called on to explain how these results are accomplished. The mode of procedure to avoid trikes is set forth in all wage agreements and is as follows:

In case of disagreement between workmen and the foreman appeal shall be made to the mill superintendent. In case of no agreement the workmen shall appeal to their committee, who shall submit the matter to the local management. In case no local settlement can be effected the question shall be referred to the District Executive Committee of the Tin Workers' Union, who shall confer with the district manager. Should no settlement be reached and a strike be deemed necessary, before such strike is declared the question shall be finally submitted to the tin workers' National Executive Committee, and in case of disagreement ten days' notice of intention to strike shall be given and work shall be continued in the interim. Should a strike occur without such procedure having been followed this entire agreement shall be considered null and void.

The association is in favor of arbitration, but not compulsory arbitration. President Powell discussed this in his annual report, and it is said to be the first plain assertion of the question by a well-known labor leader. He said in part:

Since the strike of the anthracite miners in Pennsylvania some local organizations have indorsed the idea, but after serious thought we are of the opinion that any arbitration law compulsory in its nature is detrimental to the workingmen. It is admitted that the very terms compulsory and arbitration stand in opposition to each other. Arbitration implies the voluntary action of two parties, having diverse interests, submitting to disinterested parties the questions in dispute. Compulsory arbitration takes away a man's liberty and binds him down with the shackles of serfdom as securely as any serf in feudal times. The Australian arbitration law provides for a conciliatory board, with power to use its best effort to bring contending parties together. Failing, the dispute goes to the Industrial Court, which will render an award, disobedience to which will result in imprisonment or fine, no matter how unjust the award may be or how questionable the methods used to reach it.

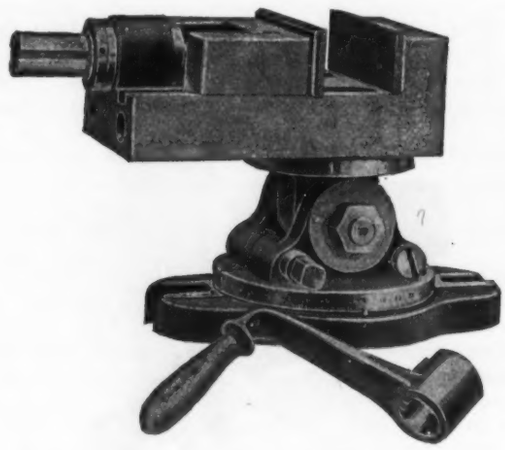
Right here in Indiana you have the arbitration law, known to most people as voluntary arbitration, voluntary because you are not forced to use it. But if employers and employees decide to take advantage of it they agree from the beginning that in case they should decline to obey the award they are willing that the judge alone, without any jury, and without any limit as to time, may send them to prison until they shall consent to perform the labor or other conditions which the award enjoins upon them. It behooves us to be alive to this question and protest against any law that will deprive us of the right to quit work at any time, for any reason sufficient to the workingman is the concrete expression of personal liberty.

The wage scale as agreed upon will be presented to the managers of the American Tin Plate Company at New York on June 1. No radical changes were made in the scale, it was announced, and it will apply to all mills but those at Elwood. The modifications were principally on account of changed conditions at the mills caused by the introduction of new machinery. The delegates would not say an increase will be demanded. Members of the association not delegates said the instructions were to demand an increase on all kinds of work. There may be a demand for the same wages to women as to men. The women members of the organization are employed in the finishing departments as assorters and reckoners, practically all tin plate going through women's hands before reaching the market. It is said that if the association can get the women's pay raised to that of the men the women will be forced out of the mills.

After a discussion as to selecting Columbus, Ohio, or Indianapolis as permanent headquarters, the question was decided in favor of Wheeling for another year. The next convention was set for Columbus.

## The Atlas Tool Makers' Vise.

The Atlas Machine Company of Providence, R. I., are manufacturing a new tool makers' vise, designed to hold any piece of small work at any angle and without chattering while being planed or milled. The vise has horizontal and vertical rotary movements and is graduated for both. The movable base, which revolves on ground cones, has a vertical movement of 55 degrees, while the horizontal movement, also on ground cones, can travel the complete circle. Each jaw has a hardened steel plate, secured by screws, thus enabling it to be removed and replaced when other than smooth surface jaws are desired. The movable jaw is made light to afford the maximum range of opening. The screw does not revolve, the handle operating a long nut by means of which the jaw is moved backward or forward. The depth of the jaw is 1 7-16 inches and the maximum opening 3 inches. The hight of the vise is 7 inches and its weight 39 pounds. Screws at the top may be adjusted to take up any wear of the slide. The company are also manufacturing a tool makers' vise with horizontal movement only. In it a worm screw releases or secures the rotary movement at the operator's will. The hight is 5 inches and the opening of the jaws 3 inches.



THE ATLAS TOOL MAKERS' VISE.

The National Steel & Wire Company are importing large quantities of steel billets from Nova Scotia. Last week 4000 tons arrived at the company's New Haven plant from Sydney. The port of New Haven has grown to new dignity since the National Steel & Wire Company began to do business, for in the past six weeks alone the customs receipts from the company for steel billets amounted to $55,000, and in a few months the total from the same source has reached $97,000, a figure larger than former receipts of the port for a full year. As a result of this sudden growth an effort will be made to improve New Haven harbor, so that large vessels may be able to unload at piers instead of into lighters, this expensive process having been necessary in the case of the National Steel & Wire Company's billets.

The British House of Commons on May 8, by 246 to 226 votes, rejected the trades disputes bill, intended to legalize peaceful picketing and alter the law affecting the liability of trades unions' funds. Premier Balfour and other Ministers opposed the bill.

## Canadian Notes.

### Rail Making at the Sault.

TORONTO, May 9, 1903.—When in Toronto on Thursday, F. H. Clergue, of the Lake Superior Consolidated Company, discussed in a newspaper interview the feasibility of making steel rails at Sault Ste. Marie, Ont. Doubts have lately been expressed in some quarters as to the favorableness of the conditions for carrying on such an industry at that point, but these doubts Mr. Clergue regards as groundless. Before the works were begun, he said, the highest authorities on the manufacture of steel rails were consulted. One point of criticism was that the coke could not be brought to the ore as cheaply as the ore to the coke, and that hence Sault rails could not be laid down at a price to compete with American rails. Mr. Clergue pointed to the Illinois Steel Company's mills at Chicago as an example of striking success in a situation where the cost of coke is at least as great as it would be at Sault Ste. Marie. For the Sault he claimed this further advantage over Chicago, that it is right in the heart of the ore field. He pronounced untrue the assertion that the ore available for the Sault mills is not the kind out of which steel rails can be made. Though, he said, the Helen mine ore is a non-Bessemer ore, it can be used with Bessemer ore to produce steel rails. Bessemer ore, he held, can be got from the company's Josephine mine, and can be obtained from the Mesaba range in Minnesota at a cost of $2.75 a ton. Some properties in the Mesaba range, he added, were recently acquired for the Lake Superior Consolidated Company. It is intended, he said, to have the rail mills in operation by the middle of June.

### Lack of Skilled Labor.

Some time ago the Canadian Manufacturers' Association represented to the Ottawa Government that lack of protection was a check upon industrial expansion. New works would be built and existing works would be enlarged if the manufacturers were sure of adequate protection. A more immediately pressing check upon expansion, however, is the lack of adequate skilled labor. There is not enough of that to keep existing works operated to their capacity. To obtain relief through immigration, a large deputation of manufacturers, chiefly consumers of iron and steel, waited on the Ontario Government some time ago with a petition for assistance to immigration of the desired kind. Since then a deputation, composed of manufacturing interests largely of the same kind, waited on the Dominion Government with representations on the same subject. Fifty employers of labor were on this deputation, and their business with the Government was to protest specially against the enactment of two bills that are proposed in the interests of labor. One of these bills would make more stringent the so-called alien labor law, which is at present practically inoperative, and which has little effectiveness when it is enforced.

Mr. Gurney of the Gurney Foundry Company, Toronto, spoke for the deputation. He said that they were opposed to the exclusion of skilled labor. The population was increasing by leaps and bounds, and immigrants were coming in by the hundreds. For every eight settlers introduced into the country the addition of a man should be made to the artisan class. There should be the greatest possible freedom not only as regards spontaneous immigration but as respects men brought in by the manufacturers. He had imported a number of Finlanders at his own expense. They were good workmen, skilled and honest, and in securing them he should be commended rather than condemned. Employment could readily be found for 20,000 men in Canada, but they were lacking. In Ontario 11,000 were needed immediately. The manufacturers had been hoping and praying for the condition of things which now existed. The condition hoped for had come, but they were not able to cope with it; not that they had not increased their plants, for in many cases the capacity had been doubled, but because the manufacturers were handicapped for want of labor.

Another member of the deputation, T. A. Russell, spoke against the union label bill, which professes to adopt the union label as a trade-mark. The union label, he asserted, was not a trade-mark, and could not be adopted as such. The idea of a trade-mark was not to protect the manufacturer, but to give the public a guarantee of workmanship. The bill would tend to destroy the trade-marks act. It would not be a guarantee for the public, and would not tend to high wages. It would accomplish the form of shop government against which the manufacturers stood opposed. The bill was based on two misleading principles—that the quantity of work should be limited, when there would be more for the individual citizen, and that all men in the same trade were equal. A very dangerous feature of this bill was that it would set the seal of the law on the boycott. The bill was not in the interest of the public. It was simply in the interest of a militant body who wished to further their own ends in connection with the boycott.

## The Patterson Exhaust Head.

In the exhaust head made by Frank L. Patterson & Co., 26 Cortlandt street, New York, the steam is deflected entirely to the outside shell, which is constantly cooled by the air. As will be seen from the engraving, there are no useless inside baffles, which soon become too hot to condense or separate the steam and only create back pressure. The inside cone shaped shell is held in place


THE PATTERSON EXHAUST HEAD.

by braces and serves to deflect the steam against the outside shell. The condensation from both cones passes out through the drip.

Imposing ceremonies marked the dedication of the World's Fair, at St. Louis, on Thursday, April 30, in the presence of an audience that taxed the resources of the building in which the exercises were held. Notabilities in church and State lent dignity and impressiveness to the ceremonial. The indications are that the attendance at the fair will be of large proportions. The interest felt in it abroad promises to surpass that manifested in regard to any previous undertaking in this country. The Louisiana Purchase Exposition bids fair to reap the benefit of the increased interest with which foreign nations regard the United States as the result of the events of the last decade, particularly the last half of it.

The original storage battery patents of Brush and others have expired, but it is asserted that no reduction in the cost of them will follow. The patent claims on these batteries were so broad that it was doubtful whether the new battery of Edison could have been introduced, but now that this obstacle is removed there is a possibility of its early appearance.

It would appear that ancient lens makers had some knowledge of their art. A lens unearthed by Layard at Nineveh, which is supposed to be thousands of years old, is now in the British museum, where it is shown by the side of modern English lenses that have been ruined by London fog and smoke. It is only fair to say, however, that the Egyptian lens is made of rock crystal.

# Hollow Pressed Axles.*—II.

BY CAMILLE MERCADER, PITTSBURGH.

Axles made as above set forth have more resiliency than the present type, and are not, therefore, liable to fracture from sudden strains. Their use in railroad car construction results directly in material economy, not only over solid axles, but over any other species of hollow axles known to the writer.

Broadly speaking, hollow axles are old, but such axles have been made either by casting them the shape desired or pressing them hollow throughout and then forging on a mandrel or by boring out solid metal. These methods are each objectionable, because they either fail to produce axles of sufficient strength and lightness or are too expensive for general adoption. The end portions of this axle are, of course, hollow, the cavities extending beyond the wheel seat, but this is an advantage because the forging action which is produced by the entrance of the punches greatly compacts and strengthens the metal and renders the axle less liable to break. The combination of hollow ends with solid center has

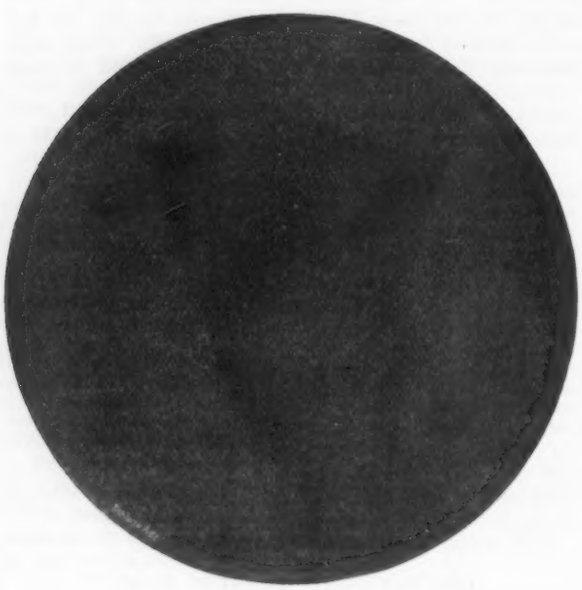


*Fig. 9.—Center Portion of Hollow Axle.—Etched with 5 Per Cent. Sulphuric Acid for 10 Hours.*

the advantage over hollow axles that all requirements for the drop tests and for torsion, produced in curves, are fully covered. It is obvious that a hollow axle will soon deform in the center under the drop test, rendering the test uncertain.

Regarding the change from a hollow to a solid section, it is important to have the section increased uniformly, avoiding any sudden changes, and accordingly the point of the punch is made to conform to the curve of a parabola. Any vibrations produced in the axle by going over switches and crossings are to be transmitted and absorbed throughout the body of the axle uniformly and in the most natural way, without fatiguing the metal in any section of the axle. This uniform transmission and absorption of the vibrations is also facilitated by the fact that the density of the metal changes with the section, being least dense in the solid part, the vibrations thus flowing from the lighter to the more compact sections, as water would flow, following an easy curve without stowing. In actual practice the solid axle usually breaks or becomes fractured at the juncture point of the journal with the wheel seat or in the body back of the wheel seat, owing generally to segregation and piping. By the new process of manufacture this is believed, and has been proven from experiments, to be entirely prevented. The metal is effectively worked from the center of the axle and from the ends of the journals.

* A paper read at the May meeting of the Iron and Steel Institute.

The greater stiffness and strength of the hollow pressed axle were demonstrated, not only by the drop tests, but furthermore confirmed by the following loading test: A Carnegie ore car having one truck fitted up

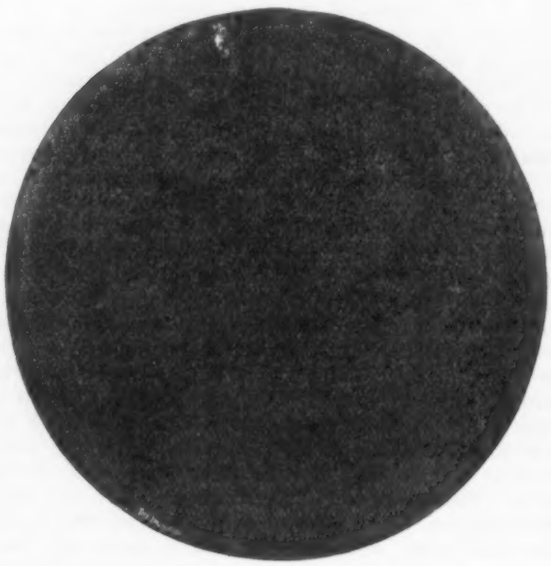


*Fig. 10.—Journal of Solid Standard Axle.*

with solid standard axles, the other truck with hollow pressed axles, was loaded with 96,500 pounds of limestone, the gross weight of the car being 131,600 pounds. The difference of the deflections measured with the instrument in the center of the axles for the loaded and the empty car was ⅛ inch for the hollow pressed and 7-32 inch for the solid standard axles, showing a greater deflection of 3-32 inch for the solid axles. To minimize this bending is, of course, of the greatest importance for the durability of the axle; when the car is in motion its effects produce a continuous change of strain in the different parts of the axle, the lower half being in compression, the upper half in tension, causing eventually detail fracture, and consequently the smaller the deflec-

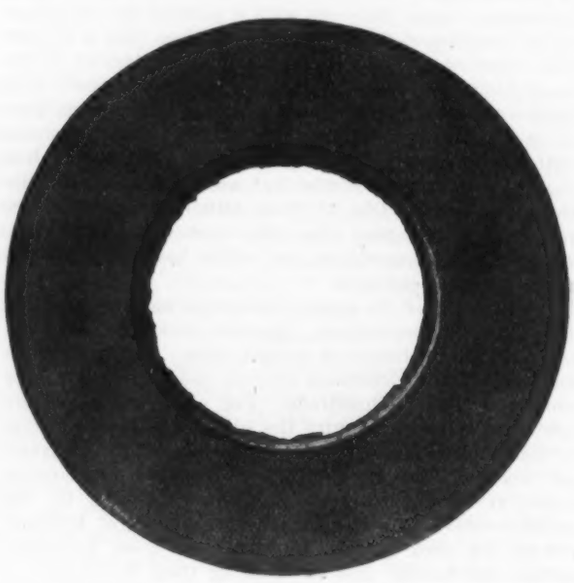


*Fig. 11.—Journal of Hollow Axle.*

tion the greater the durability of the axle, the reduction of the deflection being proportional to the square of the life of the axle.

It will be understood that heretofore, in the finishing of an axle, it has been greatly weakened by cutting away the outer skin, which has been compacted by the forging operation; but in the use of the present system a tough dense skin is produced on the interior of the

axle by the forging action of the punches, and this skin is not cut away, but remains a permanent element of strength, and the tough external skin is cut away only at the end portions. It is unnecessary, as heretofore, to machine the axle throughout its entire length, for by the dies it is compressed to exact length and made so true that it is sufficient if only the journals and wheel seat portions are turned or machined.

Tests made last year by the Howard Axle Works and the Altoona shops of the Pennsylvania Railroad Company upon 24 5½ x 10 inch journal axles to determine the relative strength of smooth forged and rough turned axles, employing tensile and drop tests for this purpose, gave the following average results of the drop test:

| Heat number | 13,008 | 21,719 | 12,768 | Average. |
|---|---|---|---|---|
| Smooth forged..... | 61 | 39 | 34 | 46 |
| Rough turned..... | 43 | 32 | 32 | 39 |

| | Smooth forged. | | | Rough turned. | | |
|---|---|---|---|---|---|---|
| Heat No. | Carbon. | Tensile strength. Pounds per sq. inch. | Elongation. Per ct. | Carbon. | Tensile strength. Pounds per sq. inch. | Elongation. Per ct. |
| 13,008 | 38.0 | 63,632 | 22.4 | 38.9 | 63,648 | 22.3 |
| 21,719 | 44.5 | 71,307 | 21.0 | 44.8 | 70.446 | 21.0 |
| 12,768 | 48.9 | 78,232 | 17.3 | 50.2 | 77,811 | 17.8 |

It was noticeable that all the smooth forged axles developed quite extensive longitudinal seams before failure, and that these appeared to have no influence whatever on the results, some of these having the most pronounced seams standing the best tests; also, just before failure, the turned axle developed cracks which followed the tool marks, indicating clearly that these had weakened them.

Neither the variations in finishing temperature nor the amount of material removed from the turned axles appeared to have any influence on the results.

From this it appears that the smooth forged axles are stronger than the rough turned, and that the difference is the more marked the lower the carbon.

Since January 1, 1895, to January 1, 1903, the Pennsylvania Railroad equipped their rolling stock with about 400,000 steel axles, both freight and passenger, the freight axles averaging 7500 miles, the passenger axles not over 20,000 miles per year. Of this number of axles six failures were due to service, two were defective forgings, two broke in detail and two by unknown causes. Two of these axles failed in the journal, the balance in the body between the wheel seats, in all cases the cause of failure being detailed fracture. In the above historical statement it should be understood that the failures outlined do not cover fractured axles discovered by car inspectors or those destroyed by wrecks.

The hollow end of the axle can be economically used for storing the oil without any part of it running to waste. The outer end of the cavity is closed by a thin disk, preferably pressed in (see Fig. 12), provided near the circumference with a very small pinhole and three

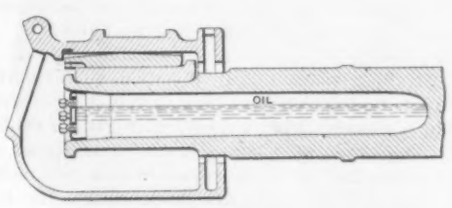



*Fig. 12.—Hollow Axle for Storing Oil.*

or four ½-inch openings closed by screws, in order to admit the oil, which cannot escape through the needle hole when car is standing. As soon as the axle starts to rotate the centrifugal power and the shaking of the car will press the oil against the surface of the pinhole, through which it seeps and drops upon the waste. By this means is insured the perfect lubrication of the journal through the waste, which brings the oil in direct communication with it, and a very small increase of the temperature of the journal is sufficient to cause its perfect lubrication, thereby removing the chief cause of hot journals.

In order to machine these axles upon the ordinary lathes false centers are inserted into the hollow ends.

If desired, the entire axle may be subjected to a tempering operation, this being preferably an oil tempering process, whereby the entire mass of metal will be tempered and refined, thereby increasing the ultimate strength and power of the axle, and at the same time improving the quality of the friction surfaces of the same. This form of axle permits the oil tempering to reach the inner vital parts thereof with the best results, so that those portions of the axle which, in use, are subjected to the greatest strain are rendered of superior effectiveness and increased power.

The drop test results of an oil tempered and annealed hollow pressed axle are given herewith:

*"D."—Axle Blank Punched at 950 Degrees C.*

Axle oil tempered at 770 degrees and annealed at 640 degrees C. Weight and dimensions as before.

| No. of blow. | Deflection. Inches. | No. of blow. | Deflection. Inches. |
|---|---|---|---|
| 1 | 3⅝ | 35 | 3¼ |
| 2 | 4⅞ | 36 | 5⅝ |
| 3 | 3¼ | 37 | 3¼ |
| 4 | 5 | 38 | 5⅛ |
| 5 | 3¼ | 39 | 3¼ |
| 6 | 5 | 40 | 5⅝ |
| 7 | 3⅛ | 41 | 3⅝ |
| 8 | 5⅛ | 42 | 5⅝ |
| 9 | 3⅛ | 43 | 3¼ |
| 10 | 4⅞ | 44 | 5¼ |
| 11 | 3⅝ | 45 | 3⅛ |
| 12 | 5⅛ | 46 | 5⅝ |
| 13 | 3¼ | 47 | 3⅝ |
| 14 | 5 | 48 | 5⅝ |
| 15 | 3¼ | 49 | 3⅝ |
| 16 | 5⅛ | 50 | 5⅛ |
| 17 | 3⅛ | 51 | 3⅝ |
| 18 | 5 | 52 | 5⅝ |
| 19 | 3⅛ | 53 | 3⅝ |
| 20 | 4⅞ | 54 | 5⅝ |
| 21 | 3¼ | 55 | 3⅛ |
| 22 | 5⅛ | 56 | 5⅝ |
| 23 | 3⅛ | 57 | 3⅛ |
| 24 | 5⅛ | 58 | 5⅝ |
| 25 | 3⅝ | 59 | 3⅝ |
| 26 | 5⅝ | 60 | 5⅞ |
| 27 | 3⅝ | 61 | 3⅛ |
| 28 | 5⅝ | 62 | 6 |
| 29 | 3⅝ | 63 | 3⅝ |
| 30 | 5¼ | 64 | 5¾ |
| 31 | 3¼ | 65 | 3⅝ |
| 32 | 5¼ | 66 | 5¾ |
| 33 | 3⅝ | 67 | Broke in center. |
| 34 | 5⅝ | | |

The steel contained: Carbon, 0.43 per cent.; manganese, 0.47 per cent.; phosphorus, 0.02 per cent.; sulphur, 0.048 per cent.

The axle was in the heating furnace for one hour and 55 minutes, and left it with a temperature of 770 degrees C. It was then delivered to an oil bath, where it remained one hour and four minutes. (This excessive time in the oil bath was occasioned by the crane being engaged with other work.) After removal from the oil bath the axle was recharged in the heating furnace, leaving same after 1 hour and 55 minutes with a temperature of 640 degrees C., and remaining in the annealing pit for five hours. In connection with this test it may be of interest to state, especially in northern countries, that the axle lay on the ground in the open air for about five hours before drop testing, the atmospheric temperature being about 10 degrees C. below zero, and considering the small deflection after the first blow this test can be regarded as remarkable, putting at rest any suspicion that the axles are unsound in any particular part; for example, at the junction of the solid and hollow part. The breaking of the axles always in the center demonstrates beyond doubt that the use of the hollow ends with a solid body combines all the qualities and advantages of both a solid axle and a hollow axle, the resisting power being almost equal to a nickel steel axle.

The following record of Carnegie nickel steel axles, tested to destruction, may be of interest. All axles 5⅝ inches diameter at center, rough turned on wheel seat and journal. Hight of drop, 44 feet; weight of drop, 1640 pounds:

*Record of Specimen Tests.*

| Chemical. | | | | | Physical. | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon. | Phosphorus. | Manganese. | Sulphur. | Nickel. | Elastic limit per sq. inch. | Tensile strength per sq. inch. | Per ct. elongation in 2 inches. | Per ct. reduction of area. | Deflection under first blow. Inches. | Number of blow at which axle started to open. | Number of blow at which axle broke. | Reduced diameter of axle. Inches. | Remarks. |
| 0.24 | 0.011 | 0.77 | 0.023 | 3.05 | 57,040 | 82,140 | 30 | 51.6 | 5 | 41st | 52d | 4¾ | Unannealed. |
| 0.26 | 0.012 | 0.75 | 0.026 | 3.30 | 58,330 | 82,000 | 30 | 54.4 | .. | ... | ... | .. | |
| 0.26 | 0.011 | 0.75 | 0.019 | 3.37 | 57,350 | 96,700 | 27 | 47 | 4¼ | 54th | 74th | 4⅝ | " |
| 0.26 | 0.012 | 0.90 | 0.022 | 3.35 | 52,540 | 93,990 | 20 | 55.3 | .. | ... | ... | .. | |
| 0.24 | 0.011 | 0.76 | 0.020 | 3.40 | 54,140 | 85,630 | 30 | 57.3 | 5 | 35th | 62d | 4½ | Annealed. |
| 0.24 | 0.011 | 0.80 | 0.019 | 3.28 | 54,180 | 85,410 | 32 | 59.3 | 5 | 46th | 79th | 4 7-16 | " |
| 0.26 | 0.011 | 0.79 | 0.022 | 3.00 | 57,190 | 85,620 | 30 | 56.9 | 5⅛ | 30th | 54th | 4¾ | " |
| 0.26 | 0.010 | 0.72 | 0.019 | 3.30 | 55,000 | 82,760 | 33 | 57.7 | 5½ | 36th | 68th | 4½ | " |
| 0.22 | 0.011 | 0.75 | 0.022 | 3.55 | 55,330 | 80,810 | 32 | 56.3 | 5¼ | 36th | 62d | 4⅝ | " |
| 0.24 | 0.014 | 0.80 | 0.021 | 3.65 | 54,510 | 83,740 | 30 | 55.1 | 4¼ | 10th | 59th | 4⅞ | " |
| 0.25 | 0.010 | 0.70 | 0.019 | 3.68 | 55,410 | 87,680 | 29 | 54.9 | 4¾ | 45th | 78th | 4⅝ | " |
| 0.24 | 0.015 | 0.74 | 0.022 | 3.10 | 55,170 | 82,090 | 32 | 57.2 | 5½ | 45th | 65th | 4⅝ | " |
| 0.24 | 0.011 | 0.68 | 0.020 | 3.55 | 54,220 | 83,100 | 31 | 55.6 | 5½ | 15th | 57th | 4¾ | " |
| 0.24 | 0.010 | 0.75 | 0.023 | 3.30 | 56,790 | 82,780 | 31 | 57.5 | 5⅝ | 36th | 60th | 4½ | " |
| 0.30 | 0.010 | 0.77 | 0.023 | 3.40 | 62,270 | 93,740 | 27 | 50.8 | 4¼ | 40th | 83d | 4⅞ | " |
| 0.26 | 0.015 | 0.80 | 0.021 | 3.05 | 58,000 | 85,660 | 33 | 58.1 | 4⅞ | 12th | 67th | 4¾ | " |
| 0.26 | 0.009 | 0.82 | 0.021 | 3.40 | 49,360 | 81,290 | 33 | 58.7 | 5⅛ | 16th | 65th | 4¾ | " |
| 0.22 | 0.009 | 0.78 | 0.019 | 3.15 | 61,280 | 84,800 | 32 | 60.4 | 5¼ | 28th | 69th | 4⅝ | " |
| 0.23 | 0.010 | 0.75 | 0.021 | 3.43 | 56,750 | 83,000 | 34 | 58.8 | 5½ | 40th | 73d | 4½ | " |
| 0.26 | 0.009 | 0.77 | 0.019 | 3.08 | 52,620 | 83,740 | 31 | 55.6 | 5¼ | 31st | 71st | 4¾ | " |
| 0.28 | 0.009 | 0.73 | 0.020 | 3.40 | 56,060 | 92,240 | 27 | 55.9 | 5¼ | 43d | 62d | 4⅞ | " |
| 0.26 | 0.009 | 0.85 | 0.020 | 3.50 | 53,960 | 81,750 | 32 | 58.9 | 5¼ | 41st | 69th | 4⅝ | " |

Regarding the quality of the steel, ordinary axle steel specifications are sufficient. The requirements are that the blank be free from seams, the diameter of the rounds be within 1-32 inch of that specified, and in the length of the blank a variation of ¼ to ⅜ inch is permissible. Providing the mill round is not true, which variation in ordinary practice usually varies 1-16 to ⅛ inch, the blank in passing through the cross rolls is reduced to a perfect circle, and the excess material, elongating the blank over the normal length, must be taken care of in the press. For this purpose one end of the dies forming the end collar on the axle is turned out sufficiently large to provide a receptacle for the flow of this excess length, thus permitting the punches to enter the axle to a uniform depth, thereby insuring at all times a uniform axle, conforming exactly to the form of the dies. The excess diameter of the collar is readily reduced to requirements in the lathe. Of course seamy steel will produce cracks upon the surface of the axle, due to the expanding action of the punch. This fact is very important, as it prevents the making of a defective axle without being detected, makes rough turning over all to show up defects unnecessary, and even the drop tests may, in time, be discarded and only surface inspection be required, because a hollow pressed axle without any cracks furnishes the best proof to the railroad companies of receiving an axle of the very best quality.

The advantages of a hollow pressed axle may be summarized as follows:

1. The axle has a perfect form; its shape can be best adapted to resist the strain to which it is subjected with the least amount of metal, combining minimum weight with maximum strength.

2. The forging effect being carried out throughout the material, both internally and externally, the material is found to be far more homogeneous than solid axles made in the usual manner, segregation is destroyed and, consequently, the axle is much more reliable.

3. The journals, being highly compressed, will in finishing attain a more highly polished surface, thereby minimizing the friction, resulting in economy of draft.

4. The journals, being hollow, will remain cooler and permit the storage of a considerable quantity of oil, removing herewith the chief cause of hot journals, also economizing materially in the expenditure for lubrication.

5. No straightening after punching is required, the axle being as straight as the die, thereby eliminating entirely the injurious effects of the gagging operation.

6. No centering, no cutting of the ends, no rough turning is required, thereby saving considerably in finishing labor and increasing the finishing capacity of existing plants.

7. The punching of treble the amount of axles as compared with forging with an equal number of hands, resulting in saving of forging labor.

8. Considerable saving in steam consumption and fuel.

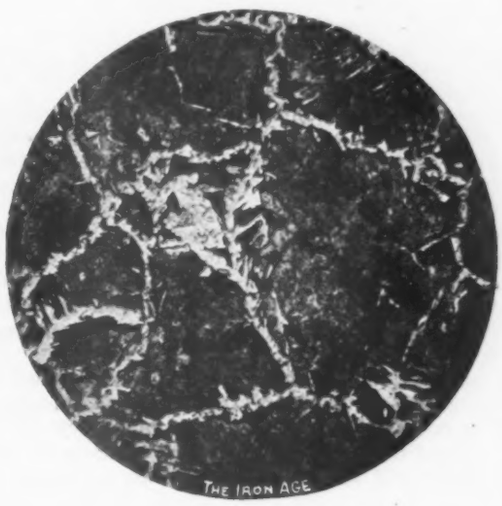

*A* 40.—*Outside.*

*A* 41.—*Center.*

*Journal of Ordinary Solid Forged Axle.*

9. Fifty per cent. increased output of existing forge departments by exchanging only the hammers for the presses, requiring about the same expenditure for installation.

A 42.—*Outside.*



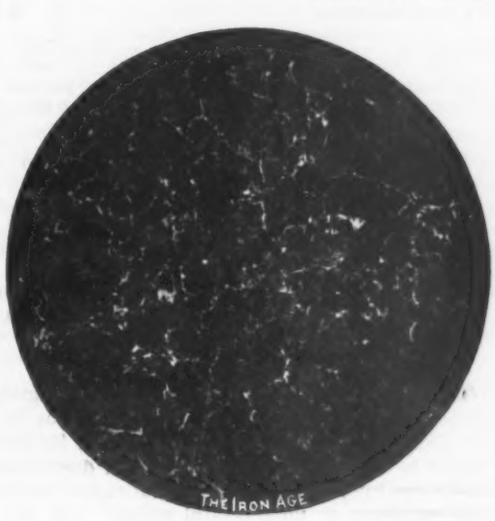

A 43.—*Center.*

*Ordinary Hollow Pressed Axle.*

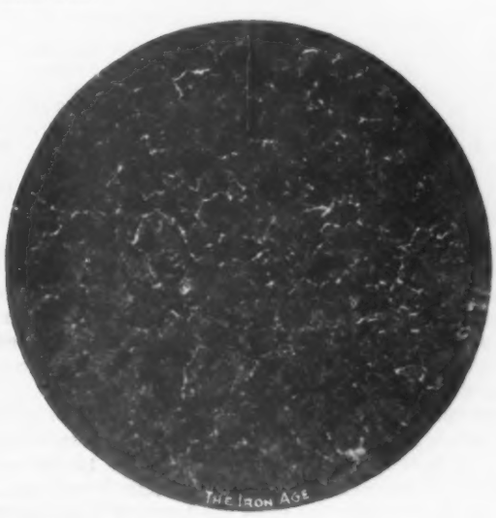

A 44.—*Outside.*


A 45.—*Between Outside and Hole.*

*Journal of Ordinary Hollow Pressed Axle.*




A 38.—*Outside.*




A 39.—*Between Outside and Hole.*

*Journal of Oil Tempered Hollow Pressed Axle.*

10. The detection of a defective axle without performing any extra work—that is, without the necessity of rough turning it over all, which provision is now included in the latest M. C. B. specifications.

11. Approximately uniform fiber stresses throughout the body of the axle, due to the straight and uniform taper between the wheel seats.

12. A saving of 29 per cent. of steel in the manufacture.

13. Present drop test specifications need not be changed.

14. The possibility of supplying uniform axles, limiting the weights and dimensions to a minimum.

15. The weight of a 100,000 pounds capacity steel car

is decreased by 1.7 per cent., permitting this load, which amounts to 24,000 pounds in a train of 40 steel cars, to be carried without any additional expenditure of energy. Converting this advantage into other channels, there would be a corresponding saving in coal consumption or tractive power.

The system is, of course, easily adaptable for the smaller sizes of axles, with a corresponding decrease in the cost of installation.

At the Düsseldorf Exhibition last year a very fine display of shafting and axles was made by the aggressive companies in Germany. The greatest number of these axles were bored throughout the entire length, having a hole about 1½ inches in diameter.

The fact that manufacturers resort to this expensive drilling, not only in axles, but in all shafting, such as crank shafts for large engines and propeller shafts, shows that the elimination of the injurious effects of segregation is absolutely essential to produce a safe and reliable shafting.

In punching these axles, by the pressure applied the protecting caps are welded to the axle blank, and therefore it may be safely concluded that any cracks which may be caused by the primary work in the solid part of the axle will be eliminated by the action of the punches.

**Remarks on the Etched Disks and Microscopic Specimens.**

There are two important factors which enter into the strength and durability of the finished axle. The first is the amount and the penetration of the work, which is put into the steel from the time it is rolled in the blooming mill until it receives its final shape under the hammer, or, as is now proposed, in a hydraulic press, preparatory to being turned up in a lathe for service; and, second, the temperature to which the steel was heated.

The etched disks and microscopic specimens shown in the accompanying photographs were prepared to illustrate these points. The disks were cut from the portions of the axles as indicated, and after polishing were etched with 5 per cent. sulphuric acid for 10 hours. The specimens were cut from these disks, as shown in Diagrams 1 and 2, so that the surfaces examined were parallel to the axis of the axle in every case.

The disk from the journal of the solid axle shows in the center practically the same grain which existed in the bloom as it came from the rolling mill, and on the edges a very much finer appearance where the work from the hammer has penetrated. This fine grain is not equidistant from the outside at every point, but has an oblong shape, the greatest depth corresponding to the edges of the bloom (7½ x 8½ inches), as is also shown in Diagrams 3 and 4.

The disk taken from the center of the hollow pressed axle shows a much more uniform grain, corresponding to the finer portion of the solid forged axle. In the neighborhood of the center the grain is slightly coarser. In the case of the disks cut from the journals from the ordinary (cooled in air) and the oil tempered hollow pressed axle the grain is practically the same, with a very fine grain extending inward a short distance from each surface. These illustrate the first point as regards work, and show that the hollow pressed axle is very much superior to the ordinary solid forged axle.

The microscopic specimens show the finishing temperatures. It will readily be seen in the photographs that the regions of the axles near the surfaces have a much finer structure than in the center, except in the oil tempered axle, which is very uniform throughout. In the case of the solid forged axle the outside was penetrated by the work to only a comparatively slight depth, and being cooler than the interior (due to the air and the cold hammer and die) has a fairly fine structure, while the center shows that due to the highest temperature to which the bloom was heated. The hollow pressed axle received work all through it, but as the portions coming in contact with the die and punches were cooled to a certain extent they were worked at a lower temperature than the center, which was very nearly as hot as when it came out of the furnace. Since the oil tempered axle was reheated to above the critical point (to 760 degrees C.) it shows a structure corresponding to that temperature. The oil tempered axle stood a better test under the drop than the one simply cooled in the air, thus showing that the finishing temperature had something to do with the result, but the most important factor is the size of the grain, as shown by the fracture, or on etching a polished disk, evidenced by the fact that so far the pressed axles have stood more uniformly good tests than the solid axles, although occasionally the latter have withstood as many as 60 odd blows of the drop.

From a commercial standpoint it would, of course, be impossible under existing conditions to oil temper axles successfully.

No troostite * was observed in the oil tempered specimens, but this would be accounted for by the fact that the mass being so large, the cooling was not sufficiently rapid.

*Composition of Axle Disks Shown in Illustrations.*

| | Carbon. | | | Phosphorus. | | | Manganese. | | | Sulphur. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Disk from— | E. | 40 per cent. | C. | E. | 40 per cent. | C. | E. | 40 per cent. | C. | E. | 40 per cent. | C. |
| Journal of solid forged axle | 0.38 | 0.46 | 0.48 | 0.009 | 0.011 | 0.012 | 0.47 | 0.49 | 0.50 | 0.025 | 0.037 | 0.039 |
| Journal of oil tempered hollow pressed axle. | 0.43 | ... | *0.45 | 0.013 | .... | *0.014 | 0.49 | ... | *0.49 | 0.042 | .... | *0.042 |
| Journal of ordinary hollow pressed axle | 0.38 | ... | *0.42 | 0.010 | .... | *0.021 | 0.54 | ... | *0.54 | 0.020 | .... | *0.030 |
| Center of ordinary hollow pressed axle | 0.38 | 0.37 | 0.39 | 0.010 | 0.011 | 0.011 | 0.57 | 0.54 | 0.54 | 0.029 | 0.020 | 0.034 |

E = Edge. 40 per cent. = 40 per cent. point (from center). C = Center.

* Taken from a point as near the hole as possible.

## Tungsten Ore Free of Duty.

The United States Court of Appeals at Philadelphia rendered a decision on May 7 in the case of O. G. Hempstead & Son, dealing with the classification for customs purposes of tungsten ore. The decision sustains the contention of the importers that the ore should be admitted free of duty and reverses decisions of the Board of General Appraisers and the Circuit Court.

Hempstead & Son entered importations of tungsten ore at Philadelphia which the collector assessed for duty at 20 per cent. ad valorem, under paragraph 183 of the Dingley tariff act. Counsel for the importers argued that the ore should be classified under paragraph 614, which admits free of duty "minerals, crude, or not advanced in value or condition by refining or grinding, or by other process of manufacture, not specially provided for in this act." Among the firms importing such ore are the American Metallurgical Works and Stein & Boericke.

A bill is pending before the Connecticut Legislature to compel the incorporation of all labor unions in that State. The supporters of the bill assert that its substantial object is to enact laws which will put down disorder and check the interference with natural rights incident to a hotly contested or unsuccessful strike. The bill provides that before labor hostilities begin between a company and their employees a notice of 30 days shall be given in the case of public service corporations and 15 days in other cases. It is argued that such a provision will be of great value in preventing industrial strikes and in securing to the public in cases of public service corporations the consideration to which it is entitled.

* F. Osmond, "Méthode Générale Contribution à l'Etude des Alliages," p. 294.

# Scotch Iron, Coal and Shipbuilding.

### The Pig Iron Market.

GLASGOW, April 30, 1903.—The iron warrant market has had a severe nip since the last letter, the price falling away rapidly on heavy selling, attributed partly to the assaults of bears on the market and partly to the realizations of outside holders made timid by the advices from America. These advices are of a lowering of all descriptions of pig iron on your side and of dullness in the finished lines. This week the sales of Cleveland warrants have been large, both on local account and from London. Prices are now about 6 shillings down from recent top. At the time of writing Cleveland is 46 shillings 9 pence; Scotch, 52 shillings 6 pence, and Cumberland hematite, 58 shillings 3 pence. East Coast hematite is back to 57 shillings for mixed numbers and Scotch hematite is 62 shillings 6 pence, delivered to steel works.

Scotch makers have not yet shown any disposition to reduce their prices currently with warrants. Here and there No. 3 brands may be 6 pence down, but, speaking generally, makers' prices are just about the quotations given in the last letter. This is because smelters are full up with orders and are not accumulating stocks. Moreover, they look for a reaction in warrants as soon as the weak bulls have been cleared out. Still, the drop in warrants has kept local consumers out of the market, and the longer they can hold back the sooner will smelters be inclined to regard lower prices. In Cleveland, also, makers' prices have not declined with warrants, and in Cumberland makers have retained their quotations for hematite.

The shipments from the Tees are now falling off in the stoppage of American orders and the absence of German demand. The shipments from Scotch ports are just about 23,000 tons ahead of last year at corresponding date. The imports of Cleveland iron into Scotland are not so heavy, and now total only 4395 tons ahead of last year at the corresponding date.

The drop in warrants, however caused, and however justified, has had a depressing effect on business. Europe is buying little pig iron from us just now. America is not buying at all, in common iron, but this week has sent orders for about 6000 tons of Cumberland hematite, 1500 tons of Scotch hematite, and also for about 6000 tons of Middlesbrough hematite for forward shipment. She is also buying and inquiring for steel, though that business will probably cease very soon. The freight market is still against a revival in shipbuilding. Steel ship plates here are £6 less 5 per cent., and in the North of England £6 less 2½ per cent. Steel bars in Lancashire are £6 7s. 6d. to £6 12s. 6d., with rather a pressure for small sizes. Common plates there are £6 10s. to £6 12s. 6d., and rolled steel joists are £6 5s., though foreign joists are being delivered in the English markets at £5 7s. 6d. Staffordshire steel billets are £4 17s. 6d. to £5 for Bessemer, and £5 to £5 2s. 6d. for Siemens; mild steel bars, £6 12s. 6d. to £7 2s. 6d.; plates, £6 5s. to £7, and girders, £6 to £6 5s.

The Scotch steel manufacturers are pretty well employed just now, even in shipbuilding material for vessels on contract, but there has been quite a break up in boiler plates.

### Labor Troubles in Shipyards.

Trouble has occurred again with regard to wages in the shipbuilding trade. The machinists on the Northeast Coast and here have, by ballot, rejected the settlement recommended by the recent joint conference of executive councils of employers and employed. That recommendation was that the men should accept a modified reduction of 1 shilling per week in time wages and 2½ per cent. in piece rates (5 per cent. on Clyde) as from May 1. They rejected these terms, and on a second ballot recorded a majority for a strike if the reduction be enforced. On the Clyde the engineers have also refused the proffered reduction, but in their case the settlement was remitted by the conference to the local associations. Then, here, the iron molders have formally intimated their refusal of the proposed reduction, and have declared their intention of lifting their tools this week without further discussion if the employers insist upon the lowering of wages, but the employers have given them another month. The position has thus again become critical, and is even more serious on the Northeast Coast than here. The awkward thing about the engineers (machinists) in this locality is that such large numbers of them are engaged in other than marine engine shops and in branches of work that are not depressed like shipbuilding. These naturally object to have their wages lowered because there is slackness in the shipbuilding branch.

### The Coal Trade.

There is rather more movement now in the coal markets, as the North Europe shipping seasons opens; but it is not expected to be a very busy season. Prices are now on a low range. Thus, in Scotland, best "ell" coal is selling at 8 shillings 9 pence to 9 shillings 6 pence per ton, f.o.b. Glasgow, as compared with 9 shillings 3 pence to 10 shillings at this time last year; "splint" at 9 shillings and steam at 9 shillings 6 pence, which are just about the same quotations as were current a year ago. But, then, one never knows in dull times how much sellers may concede off current quotations in order to obtain an order. The reports of foreign contracts secured name figures that even on current low freights come under f.o.b. quotations for coal.

A recovery in the Welsh market, by the way, has steadied coal circles here this week, but the trade generally is displeased with the Chancellor of the Exchequer for not removing the export coal duty, as well as or in place of the import corn duty. The corn duty does nobody any harm, but the coal duty presses on our export trade, plays into the hands of our foreign competitors, and is distinctly a burden on shipping, inasmuch as the duty is, wherever possible, taken off of freight. Those who can see further beyond their noses than an ordinary departmental official foresee that when the boom in American industries eases off the output of the American coal mines as now developed will be more than can be consumed in the States. This means within the next year or two a renewal of the American exports of coal, but on a larger scale than ever.

The coal combine conducted under the title of the United Collieries, Limited, whose headquarters are in Glasgow, have an output of about 6,000,000 tons per annum. Negotiations are now on foot for the addition to the combine of three independent coal companies in Lanarkshire and Stirlingshire, whose output will add about 5000 tons per day to the production of the combine. This will be the biggest coal combination in the whole United Kingdom.

The details are about completed for the purchase by a London syndicate of all the malleable iron works in the Coatbridge and Motherwell producing districts near this. It is, I believe, arranged that the venders are to get £360,000 in cash for their works and plant, and that a company will be registered, with a capital of £1,000,000, to carry on the whole industry under one management.

B. T.

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A steam turbine engine recently installed at the Cumberland Mills, Portland, Maine, has given remarkable economic results. It is of 540 horse-power, and is intended chiefly as a reserve power in case the water power usually employed fails from any cause. The turbine is worked at 165 pounds steam pressure, and the boiler is 350 feet from the engine. Before entering the chest the steam is reheated 10 degrees by waste hydrogen from the electrolytic baths used in some operations, a by-product, which could not be utilized previously. The engine is condensing and obtains a very high vacuum—28 inches—from a surface condenser with gravity circulation. The space occupied by the steam plant is only 13-100 of a square foot per indicated horse-power, and the steam consumption is 11 pounds per hour per indicated horse-power, when the steam is superheated to 100 degrees.

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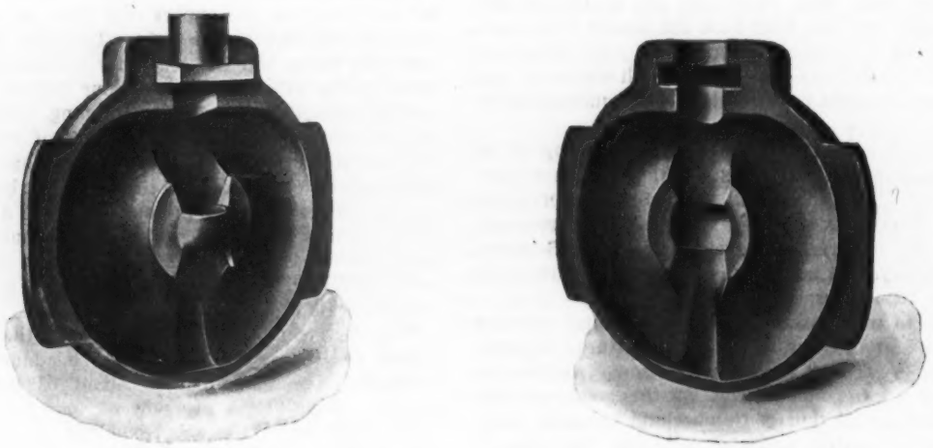
The F. B. Shuster Company of New Haven, Conn., are to build their new Shuster model wire straightening machine, which was shown in *The Iron Age* last week, in a full line of sizes. At present the new model is manufactured up to the ⅜-inch size, the Adt machine still being built in the larger sizes.

## The New Kennedy Gate Valve.

The new gate valve designed by the Kennedy Valve Mfg. Company of 58 Beekman street, New York, is called the Lenticular double disk taper seat valve, the word "lenticular" being used to denote the double convex form or lens shape of the center piece between the two disks. In this valve there are only four parts which are moved by the action of the screw—the two disks, the lenticular bearing or center piece and the stem nut. The disks are provided with recesses or pockets to admit the shoulders or projections cast on the stem nut and from which the disks are suspended, and on the back of each disk is a projection having its face concaved and fitting the convex faces of the center piece, thus making a true center bearing. The construction and relation of the rings on the disks and of the center piece are such that the disks have perfect freedom of movement around the center. The disks are also provided on either side with guide wings, which work between the guides cast in the body of the valve, and their function is to control the position of the disks when opening or closing the valve. By means of these guides the disks are held in a central position, thus making it impossible for them to come in contact with the seat rings, except at the moment of closing, thereby avoiding all liability to mar or deface them. The center piece has two convex faces, which are segments of a true sphere, and which are arranged in a ring form to allow the passing through of the stem. The convex faces of the center piece and concave faces of the projection on the back of the disk conform to each other, and when the valve is closed the disks are forced to their seats from the center with an equal evenly distributed pressure at every point. These valves are at present furnished for steam pressures up to 160 pounds.



*Back Views of Disks.*

THE NEW KENNEDY GATE VALVE.

The factors of safety in some high powered torpedo boat engines and their details are very small. It is stated that a feed pipe gave way on a trial, and, the check valves having jammed open, this allowed the water to blow out of the boiler, there being apparently no shut off on the feed pipe between the check valves and the boiler. The pipe was 3½ inches in diameter, and there was a split in it 3½ inches long. When the thickness of the walls of the pipe was measured it was found to be only 1-32 inch.

A meeting of the Cook County Founders' Association, Chicago, was held on Thursday afternoon, May 7, having been postponed from May 5. A large part of the session was consumed in discussing the constitution and by-laws, and it was decided that a copy should be furnished to each member before final ratification. The election of officers was postponed until next Thursday, when another meeting will be held.

## The Union Engineering Building.

On the evening of May 7, in accordance with invitations, the boards of directors of the several bodies interested, as well as some other members of the different societies, held an informal meeting at the house of the American Society of Civil Engineers, to consider the gift of $1,000,000 from Andrew Carnegie for a Union Engineering Building. Sixty-five gentlemen were present, including Presidents A. Noble of the Civil Engineers, Dr. A. R. Ledoux of the Mining Engineers, J. M. Dodge of the Mechanical Engineers, C. F. Scott of the Electrical Engineers, and J. C. Kafer of the Engineers' Club. The meeting organized with the election of Mr. Noble as chairman and T. C. Martin as secretary. A very free, frank and open discussion of the subject, its advantages and its possible objections was had, lasting about three hours.

The President of the American Society of Mechanical Engineers, James Mapes Dodge, reported that at a meeting of their Council in the afternoon the formal resolution proposed in the letter of W. A. Redding, May 1, had been adopted, and a committee appointed comprising Prof. F. R. Hutton, C. Wallace Hunt, and himself. This committee is to act first as a conference committee, and is authorized to make such changes in harmony with the spirit of the resolution adopted as may be deemed advisable upon conference with the committees of the other bodies. The same committee is to be retained as a permanent committee.

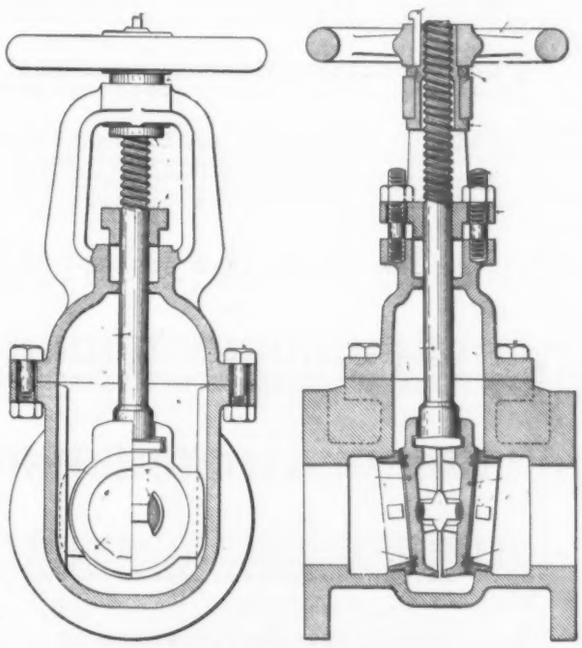
The President of the American Institute of Electrical Engineers stated that the Board of Directors had indorsed the resolution proposed by Mr. Redding, and had appointed a conference committee, comprising Calvin W. Rice, T. C. Martin and himself, with instructions to report back a definite form of resolution, which should be adopted. He further stated that it was expected by the board that final action would be taken on May 19, as there was a board meeting and also an annual meeting of the Institute on that day.

The president, and the secretary, Dr. Raymond, of the American Institute of Mining Engineers, stated that their institute would have a board meeting on the following day. Both of the gentlemen, however, were in hearty accord with the plan, and said that they considered it, not a question of whether they should come in, but of the best ways and means of doing so.

The American Society of Civil Engineers will probably have a board meeting within the coming week. One of the past presidents, Geo. S. Morison, stated that as they already had a building the conditions were different with their society; but after giving the matter careful consideration he was of the opinion, speaking for himself, that the relations which they should sustain to the general engineering interests were such that, leaving

aside their own individual preferences, the society should join with the others.

Representatives of the Engineers' Club expressed hearty accord with the general scheme. Mr. Kafer stated that delegates to the conference would be appointed at the meeting of officers on May 11.



*Sections.*

for otherwise making it possible to accept and utilize this sum by his liberal, unencumbered and prompt co-operation in financing a suitable site.

"2. That it is their firm belief that the result of this initiative will be potent for good, and of far-reaching inclusiveness, greatly increasing the effectiveness of the engineering profession, both technically and socially, and with corresponding benefits to the industrial arts and the world at large.

"3. That they hereby tender to Andrew Carnegie their gratitude for his generous offer."

The following cable was forwarded to Mr. Carnegie:

"Members of engineering societies and the Engineers' Club informally assembled send this message of gratitude for your generous offer.

"T. C. MARTIN, Secretary."

It was agreed that the Conference Committee, consisting of three representatives from each of the five bodies, should be called to determine upon the next steps and the next action by the several bodies at the call of Mr. Scott.

The following have been appointed members of this Conference Committee:

American Institute of Mining Engineers: Dr. A. R. Ledoux, president; C. Kirchoff, Theodore Dwight.

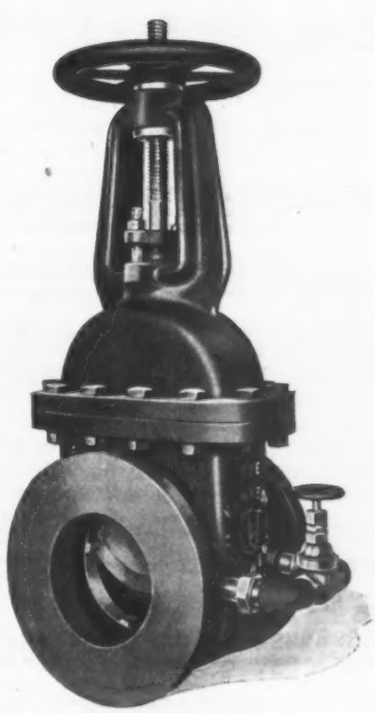
American Society of Mechanical Engineers: James M. Dodge, president; F. R. Hutton, secretary; C. Wallace Hunt.

American Institute of Electrical Engineers: C. F. Scott, president; Calvin W. Rice, T. C. Martin.

Engineers Club: J. C. Kafer, president; W. H. Fletcher, W. A. Redding.

The committee of the American Society of Civil Engineers has not yet been named. The meeting has been called for Friday, May 15.

Mr. Kafer stated during the evening that Mr. Carnegie had also undertaken to finance the land for the societies, and that interest at 4 per cent. on the land investment would not be asked by Mr. Carnegie until the building itself was finished. Mr. Carnegie's financial agent, R. A. Franks, had already paid out for them $50,000 in options on the properties on Thirty-third street, which now represented a buying price of $517,000.



*Outside Rising Stem and Yoke with By-Pass.*


*Inside Stationary Stem.*

THE NEW KENNEDY GATE VALVE.

The following resolutions were adopted without a dissenting vote.

# The Development of the Continuous Open Hearth Process.*

BY BENJAMIN TALBOT (LEEDS).

In May, 1900, it may be remembered that a paper was read by the author before this institute, describing what is known as the continuous process of steel making, in which were given the results that had been obtained up to that date in the furnace working this process at Pencoyd, Pa.

Since that date considerable progress has been made and some results have been obtained which he ventures to think may be of interest to the institute. At that time the furnace at Pencoyd, which has held as much as 75 tons of metal, was considered large, but we have already progressed, and this is now spoken of as a small furnace. In the discussion on that paper E. P. Martin stated that, in his opinion, furnaces in the future worked on this continuous system would be of about 200 tons capacity, and this prophecy has already been fulfilled, a furnace of this size (200 tons) having been in operation for some few months at the works of Jones & Laughlin Steel Company, at Pittsburgh, Pa. In addition to this, furnaces of very nearly this capacity are being erected both in this country and in France, and a number of 200-ton furnaces will shortly be erected in the States.

The author has quite recently had the opportunity of investigating the working of the 200-ton furnace at Pittsburgh, and also of revisiting Pencoyd and of learning what has been done there since the date of his former paper in the furnace already referred to.

At Pencoyd the furnace is still working with identically the same hearth with which it started the process, now some three and a half years ago.

The furnace is holding on an average from 60 to 65 tons, and the average weekly output is 650 tons per week, from liquid cupola metal containing about 0.8 per cent. phosphorus. The yields which were established by the figures given in the previous paper—viz., a gain of from 5 to 7 per cent. on the total metal charged in—have been fully maintained.

The author would emphasize the fact that this furnace, although it has been spoken of as a 75-ton furnace, has in reality a surface area of only 9 feet by 30 feet at the bath or fore plate level, and consequently is about the size of so-called 30-ton fixed furnaces. The bath, however, is somewhat deeper than that which would be worked in a fixed furnace.

### The Jones & Laughlin Furnace.

The 200-ton furnace at the Jones & Laughlin Steel Company has been in operation since last summer, and although they have had some minor troubles with details in the design of the furnace, which in a furnace differing so radically from existing furnaces as regards size is not perhaps to be wondered at; yet when the author was there in the month of February last they had surmounted these small preliminary troubles and were running very satisfactorily. The work with this furnace is more than ordinarily interesting, because their liquid blast furnace metal is of hematite quality, containing some 0.1 per cent. phosphorus, which is the standard Bessemer metal of Pittsburgh. In fact, the same storage vessel which supplies the Bessemer converters supplies the 200-ton open hearth furnace. The lining of the furnace is composed of magnesite bricks, with calcined magnesite fused on. In the author's opinion a good quality of shrunk dolomite for fusing on is perfectly satisfactory. The furnace is supplied with natural gas, which is one of the advantages of the Pittsburgh district. It is arranged to tilt so that the center of rotation is coincident with the port which supplies the gas in every position. The furnace is oval in shape, being 17 feet 6 inches wide in center, with curved sides diminishing to 14 feet 6 inches at the ends, and is 40 feet long between ports. This gives a surface area at the fore plate level of about 640 square feet. The furnace tilts both ways, so that the slag can be taken from the slag spouts in the fore plates on the charging side of the furnace whenever desired, and this

* A paper read before the Iron and Steel Institute.

*Table A.—Working in the 200-Ton Furnace at Jones & Laughlin's, for Week Ending February 21, 1903.*

| Heat No. | Commenced charging. | Heat tapped. | Tap to tap. Hrs. M. | Cold pig. Pounds. | Liquid pig. Pounds. | Composition of pig. Si. | S. | Scrap. Pounds. | Iron ore with 60 % iron. | Scale.* Pounds. | Lime. Pounds. | Ferro-manganese. Pounds. | Product. Ingots. Pounds. | Scrap. Pounds. | Carbon. Reqd. | Carbon. Obtd. | Phos. phorus. | Manganese. | Sulphur. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12,672 | 10 p.m. on 14th | 5.55 p.m. | ... | 112,000 | 64,100 | 1.08 | 0.060 | 220,600 | 800 | 4,500 | 10,600 | 300 | 41,600 | 2,000 | 0.15-0.20 | 0.16 | 0.028 | 0.56 | 0.047 |
| 12,673 | 6 " 15th | 9.15 " | 3 20 | ..... | 62,200 | 1.54 | 0.050 | ..... | 700 | 4,500 | 3,225 | 500 | 102,800 | .... | 0.15-0.20 | 0.17 | 0.030 | 0.44 | 0.046 |
| 12,674 | 9.20 " 15th | 2.25 a.m. | 5 10 | ..... | 103,800 | 0.98 | 0.056 | ..... | 5,200 | 9,000 | 3,225 | 450 | 82,000 | .... | 0.15-0.20 | 0.21 | 0.042 | 0.51 | 0.043 |
| 12,675 | 2.28 a.m. on 16th | 6.25 " | 4 0 | ..... | 79,100 | 1.15 | 0.036 | ..... | 5,200 | 7,200 | 4,300 | 500 | 88,400 | 1,000 | 0.15-0.20 | 0.16 | 0.037 | 0.46 | 0.048 |
| 12,676 | 6.29 " 16th | 11.10 " | 4 45 | ..... | 89,400 | 0.99 | 0.053 | ..... | .... | 10,800 | 6,450 | 380 | 92,200 | .... | 0.15-0.20 | 0.19 | 0.024 | 0.40 | 0.049 |
| 12,677 | 11.13 " 16th | 3.10 p.m. | 4 0 | ..... | 91,400 | 0.90 | 0.060 | ..... | .... | 11,700 | 5,375 | 380 | 87,090 | .... | 0.22-0.26 | 0.30 | 0.025 | 0.43 | 0.055 |
| 12,678 | 3.13 p.m. on 16th | 8.20 " | 5 10 | ..... | 91,800 | 0.81 | 0.064 | ..... | 2,600 | 10,800 | 3,225 | 500 | 87,700 | 2,000 | 0.22-0.26 | 0.28 | 0.028 | 0.50 | 0.057 |
| 12,679 | 8.27 " 16th | 1.15 " | 4 55 | ..... | 92,100 | 1.00 | 0.045 | ..... | 2,600 | 11,700 | 4,300 | 500 | 60,550 | 29,300‡ | 0.15-0.20 | 0.16 | 0.027 | 0.56 | 0.062 |
| 12,680 | 1.20 a.m. on 17th | 5.57 a.m. | 4 42 | ..... | 87,400 | 1.10 | 0.059 | ..... | .... | 10,800 | 6,450 | 450 | 92,700 | 3,000 | 0.15-0.20 | 0.17 | 0.024 | 0.43 | 0.050 |
| 12,681 | 6.3 " 17th | 10.10 " | 4 13 | ..... | 79,600 | 1.10 | 0.059 | ..... | .... | 11,700 | 5,375 | 380 | 88,400 | .... | 0.15-0.20 | 0.16 | 0.015 | 0.38 | 0.054 |
| 12,682 | 10.15 " 17th | 2.35 p.m. | 4 25 | ..... | 96,190 | 1.5 | 0.049 | ..... | 1,400 | 11,700 | 6,450 | 380 | 93,600 | .... | 0.15-0.20 | 0.25 | 0.013 | 0.40 | 0.052 |
| 12,683 | 2.38 p.m. on 17th | 7.30 " | 4 55 | ..... | 97,100 | 1.00 | 0.040 | ..... | 500 | 12,600 | 4,300 | 450 | 88,400 | 2,000 | 0.22-0.26 | 0.26 | 0.025 | 0.44 | 0.049 |
| 12,684 | 7.33 " 17th | 1.20 a.m. | 5 50 | ..... | 110,000 | 1.00 | 0.040 | ..... | 5,200 | 11,700 | 5,375 | 450 | 93,600 | .... | 0.22-0.26 | 0.25 | 0.024 | 0.45 | 0.045 |
| 12,685 | 1.24 a.m. on 18th | 6.40 " | 5 20 | ..... | 97,900 | 0.90 | 0.062 | ..... | 5,200 | 11,700 | 5,375 | 450 | 88,400 | .... | 0.15-0.20 | 0.17 | 0.025 | 0.46 | 0.046 |
| 12,686 | 6.45 " 18th | 11.40 " | 5 0 | ..... | 95,200 | 0.80 | 0.045 | ..... | .... | 11,700 | 5,375 | 380 | 88,400 | 2,500 | 0.15-0.20 | 0.22 | 0.013 | 0.39 | 0.053 |
| 12,687 | 11.44 " 18th | 3.45 p.m. | 4 5 | ..... | 90,200 | 1.00 | 0.048 | ..... | .... | 11,700 | 5,375 | 380 | 92,950 | .... | 0.18-0.24 | 0.24 | 0.018 | 0.40 | 0.055 |
| 12,688 | 3.49 p.m. on 18th | 8.35 " | 4 50 | ..... | 94,200 | 1.00 | 0.047 | ..... | 2,600 | 11,700 | 4,300 | 450 | 100,800 | .... | 0.18-0.24 | 0.18 | 0.021 | 0.44 | 0.048 |
| 12,689 | 8.40 " 18th | 1.10 a.m. | 4 35 | ..... | 110,800 | 1.14 | 0.043 | ..... | .... | 11,700 | 4,300 | 450 | 92,950 | 1,000 | 0.18-0.24 | 0.23 | 0.025 | 0.51 | 0.046 |
| 12,690 | 1.15 a.m. on 19th | 6.20 " | 5 10 | ..... | 82,200 | 1.19 | 0.060 | ..... | .... | 11,700 | 6,450 | 450 | 92,950 | 2,000 | 0.18-0.24 | 0.19 | 0.021 | 0.45 | 0.052 |
| 12,691 | 6.25 " 19th | 11.8 " | 4 48 | ..... | 95,100 | 1.25 | 0.055 | ..... | 600 | 11,700 | 5,375 | 350 | 87,100 | .... | 0.15-0.18 | 0.19 | 0.019 | 0.38 | 0.056 |
| 12,692 | 11.11 " 19th | 3.25 p.m. | 4 17 | ..... | 73,400 | 1.25 | 0.055 | ..... | .... | 12,600 | 5,375 | 400 | 93,600 | 1,200 | 0.15-0.18 | 0.19 | 0.016 | 0.38 | 0.051 |
| 12,693 | 3.28 p.m. on 19th | 8.38 " | 5 13 | ..... | 97,600 | 1.18 | 0.045 | ..... | 2,600 | 12,600 | 6,450 | 400 | 87,400 | .... | 0.15-0.18 | 0.20 | 0.016 | 0.43 | 0.047 |
| 12,694 | 8.42 " 19th | 1.28 a.m. | 4 50 | ..... | 89,300 | 0.98 | 0.068 | ..... | .... | 10,800 | 4,300 | 400 | 98,400 | 3,000 | 0.15-0.18 | 0.21 | 0.019 | 0.54 | 0.053 |
| 12,695 | 1.33 a.m. on 20th | 6.35 " | 5 7 | ..... | 93,700 | 1.05 | 0.065 | ..... | .... | 11,600 | 6,450 | 400 | 93,600 | 3,500 | 0.15-0.18 | 0.16 | 0.019 | 0.38 | 0.050 |
| 12,696 | 6.40 " 20th | 11.35 " | 5 0 | ..... | 95,700 | 1.19 | 0.045 | ..... | 600 | 12,600 | 5,375 | 350 | 92,290 | .... | 0.15-0.18 | 0.17 | 0.013 | 0.38 | 0.055 |
| 12,697 | 11.38 " 20th | 4.15 p.m. | 4 40 | ..... | 93,600 | 1.23 | 0.040 | ..... | .... | 11,700 | 5,375 | 580 | 92,290 | 500 | 0.15-0.18 | 0.21 | 0.021 | 0.47 | 0.050 |
| 12,698 | 4.18 p.m. on 20th | 9.5 " | 4 50 | ..... | 94,400 | 1.14 | 0.047 | ..... | 2,600 | 11,700 | 6,450 | 400 | 88,400 | .... | 0.15-0.20 | 0.22 | 0.019 | 0.57 | 0.045 |
| 12,699 | 9.7 " 20th | 2.45 a.m. | 5 40 | ..... | 89,600 | 1.04 | 0.059 | ..... | .... | 11,700 | 5,375 | 450 | 93,600 | 3,000 | 0.18-0.24 | 0.18 | 0.016 | 0.55 | 0.049 |
| 12,700 | 2.47 a.m. on 21st | 7.5 " | 4 20 | ..... | 84,600 | 1.25 | 0.060 | ..... | .... | 11,700 | 5,375 | 380 | 97,490 | .... | 0.18-0.24 | 0.22 | 0.019 | 0.43 | 0.049 |
| 12,701 | 7.8 " 21st | 11.40 " | 4 35 | ..... | 127,500 | 1.30 | 0.055 | ..... | 800 | 12,600 | 6,450 | 480 | 114,400 | .... | 0.40 | 0.39 | 0.025 | 0.43 | 0.057 |
| 12,702 | 12 " 21st | 2.40 p.m. | 4 20 | ..... | 30,000 | .... | .... | ..... | 5,800 | ..... | 2,150 | 450 | 121,550 | 2,000 | 0.15-0.20 | 0.19 | 0.025 | 0.42 | 0.063 |
| 12,703 | 2.5 p.m. on 21st | 2.40 " | 6 40 | ..... | 10,400 | .... | .... | ..... | .... | ..... | 1,075 | 450 | 109,200 | 1,500 | 0.15-0.20 | 0.20 | 0.027 | 0.42 | 0.063 |
| 12,704 | 3.5 " 21st | 8.25 " | 0 45 | ..... | 9,800 | .... | .... | ..... | .... | ..... | ..... | 450 | 104,300 | 2,100 | 0.15-0.20 | 0.18 | 0.021 | 0.37 | 0.058 |
| 12,705 | ..... | 4 " | .... | ..... | ..... | .... | .... | ..... | 2,600 | ..... | ..... | 400 | 83,200 | 5,600 | ..... | 0.08 | 0.024 | 0.24 | 0.062 |
| 84 | | | 4 17 | 112,000 | 2,799,300 | 1.10 | 0.052 | 220,600 | 47,600 | 330,200 | 105,400 | 14,520† | 3,102,400 | 67,200 | ..... | ... | 0.022 | 0.44 | 0.052 |

Metal tapped—ingot and scrap.....1,415.0 tons.
Metal charged, including ferro.....1,404.6 tons.

Gain..... 10.4 tons.
= 0.74 per cent.

* Dry scale with 70 per cent. iron and 10 per cent. sulphur.
† 10.2 pounds per ton of ingot.
‡ Stopper in steel ladle failed.

is done very satisfactorily. The design of the tilting arrangement is elaborate, but it forms a fine piece of engineering work. The ports now used on this furnace are much the same as those used at Pencoyd and at Frodingham, and consist of one gas port in the center, with an air port at a slightly higher elevation on each side of it.

The author was at Pittsburgh in February, and watched the working of this furnace throughout the week ending February 21. The results obtained during this week are summed up in Table A, and the details of two charges are fully set out in Tables B and C. It should be stated that the week was a stormy one, the weather being very severe, which militated against getting the best output from the furnace, many of the charges being delayed by the severity of the weather.

The liquid pig metal used was the standard Bessemer used in the States and came from the receiver which supplies the Bessemer direct. The average composition may be taken as: Total carbon, 4.0 per cent.; silicon, 1 to 1.25 per cent.; phosphorus, 0.1 per cent.; manganese, 0.65 per cent.; sulphur, 0.06 per cent. It will be noted that the furnace was partly charged on Saturday night by putting in cold scrap and cold pig iron, which was continued until some 150 tons had been charged in by about 7 a.m. on Sunday morning. Between 3.30 and 4.30 on Sunday afternoon some 30 tons of liquid metal were poured in, and the first heat was taken out of the furnace by 5.55 p.m. on Sunday evening. It is the usual practice in the Pittsburgh district to get heats ready in the steel furnaces and in the Bessemer departments, so that the rolling mills can start up and begin to roll on Sunday evening. Apart from this, if liquid steel is not retained in the furnaces during the week end it would seem that the proper way to work such large furnaces is by charging in cold material on Saturday night, so that it could be quietly melted down during Sunday, the only skilled attention required being from the furnaceman to look after the gas in the furnace.

The various operations during the week can be best followed from the table. Heats of from 40 to 50 tons were taken out about every four and a half hours, the carbon in the steel cast running from 0.15 to about 0.40 per cent. It will be seen that the iron ore and dried scale used averages about 13.5 per cent. on the liquid metal charged, and this will no doubt be increased as they shorten the time in working the heats. The ferromanganese used works out to 10.2 pounds per ton of steel. As will be seen, the total make of steel during the week was 1415 tons, consisting of 1385 tons of ingots and 30 tons of scrap, the scrap including butts of all descriptions and scrap due to defective stopper on heat 12,679. In this heat the advantage of casting by means of an overhead traveling crane was clearly shown, for when it became evident that the stopper in the first ladle could not be used the whole contents of this first steel ladle were at once teemed into a second ladle by the auxiliary on the overhead crane, and the second ladle then picked up by the crane and the casting continued in the ordinary way. In ordinary English practice, with the ladle on the usual carriage and no overhead system, the whole of the charge would have had to have been poured out over the lip, which is well known to be unsatisfactory. The yield of steel and scrap on the total metals charged works out to 100.7 per cent. Owing to the extremely wet state of the scale which was chiefly used, the oxides added during this week were purposely limited, so that the yield is not so high as it would otherwise be. To show how near the carbons absolutely obtained in the steel agree

*Table B.—Details of Charge* 12,677.

| Charge. | | | | | Analysis of metal. | | | | | Analysis of slag. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Time. | Name of sample. | Weight of metal. Pounds. | Scale. Pounds. | Lime. Pounds. | Carbon. | Silicon. | Sulphur. | Phosphorus. | Manganese. | Iron. | Silica. | Lime. |
| 11.10 a.m. | Tapping slag and weight of metal left in furnace from heat 12,676 | 322,560 | .... | .... | ... | ... | .... | .... | ... | 10.36 | 17.80 | .... |
| 11.13 " | Added | .... | 10,800 | .... | ... | ... | .... | .... | ... | .... | .... | .... |
| 11.34 " | Added | .... | .... | 3,225 | ... | ... | .... | .... | ... | .... | .... | .... |
| 12.5 p.m. | Analysis of bath and slag | .... | .... | .... | 0.06 | ... | .... | 0.009 | ... | 31.74 | 12.20 | .... |
| 12.10 " | Charged | 46,000 | .... | .... | 4.00 | 0.90 | 0.060 | 0.10 | 0.65 | .... | .... | .... |
| | Calculated mixture | .... | .... | .... | 0.55 | ... | .... | .... | ... | .... | .... | .... |
| 12.17 " | Analysis after first reaction | .... | .... | .... | 0.44 | ... | .... | 0.009 | ... | 22.93 | 18.80 | 35.30 |
| | Percentage of reduction | .... | .... | .... | 20 p. c. | ... | .... | .... | ... | .... | .... | .... |
| 12.25 " | Added | .... | 1,800 | .... | ... | ... | .... | .... | ... | .... | .... | .... |
| 1.20 " | Added | .... | 10,800 | 2,150 | ... | ... | .... | .... | ... | .... | .... | .... |
| 1.55 " | Analysis of bath and slag | .... | .... | .... | 0.09 | ... | .... | 0.009 | ... | 29.59 | 15.0 | .... |
| 2.00 " | Charged | 45,400 | .... | .... | 4.00 | ... | .... | .... | ... | .... | .... | .... |
| | Calculated mixture | .... | .... | .... | 0.51 | ... | .... | .... | ... | .... | .... | .... |
| 2.9 " | Analysis of bath and slag | .... | .... | .... | 0.48 | ... | .... | .... | ... | 20.58 | 18.70 | .... |
| | Percentage of reduction | .... | .... | .... | 6 p. c. | ... | .... | .... | ... | .... | .... | .... |
| 3.5 " | Analysis of bath and slag before tapping | .... | .... | .... | 0.26 | ... | .... | 0.023 | ... | 9.06 | 24.40 | 40.90 |
| 3.10 " | Ladle test | .... | .... | .... | 0.30 | ... | 0.055 | 0.025 | 0.43 | .... | .... | .... |

Weight of ingots produced, 87,090 pounds.
Time from commencement of charging to tapping of heat, 3 hours 57 minutes.

*Table C.—Details of Charge* 12,697.

| Charge. | | | | | Analysis of metal. | | | | | Analysis of slag. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Time. | Name of sample. | Weight of metal. Pounds. | Scale. Pounds. | Lime. Pounds. | Carbon. | Silicon. | Sulphur. | Phosphorus. | Manganese. | Iron. | Silica. | Lime. |
| | Tapping slag and weight of metal left in furnace from heat 12,696 | 351,680 | .... | .... | ... | ... | .... | .... | ... | 9.46 | 22.45 | 41.30 |
| 11.42 a.m. | Added | .... | 12,600 | 3,225 | ... | ... | .... | .... | ... | .... | .... | .... |
| 12.33 p.m. | Analysis of bath and slag | .... | .... | .... | 0.06 | ... | .... | 0.009 | ... | 40.58 | 13.20 | .... |
| 12.40 " | Charged | 40,000 | .... | .... | 4.00 | 1.28 | 0.035 | .... | ... | .... | .... | .... |
| | Calculated mixture | .... | .... | .... | 0.46 | ... | .... | .... | ... | .... | .... | .... |
| 1.7 " | Analysis after first reaction | .... | .... | .... | 0.15 | ... | .... | 0.010 | ... | 17.51 | 21.60 | .... |
| | Percentage of reduction | .... | .... | .... | 68 p. c. | ... | .... | .... | ... | .... | .... | .... |
| 1.45 " | Added | .... | 10,800 | 2,150 | ... | ... | .... | .... | ... | .... | .... | .... |
| 2.7 " | Analysis of bath and slag | .... | .... | .... | 0.06 | ... | .... | .... | ... | 33.76 | 13.80 | .... |
| 2.35 " | Charged | 38,000 | .... | .... | 4.00 | 1.18 | 0.045 | 0.10 | ... | .... | .... | .... |
| | Calculated mixture | .... | .... | .... | 0.48 | ... | .... | .... | ... | .... | .... | .... |
| 2.37 " | Analysis of bath and slag | .... | .... | .... | 0.16 | ... | .... | .... | ... | 22.07 | 20.20 | .... |
| | Percentage of reduction | .... | .... | .... | 66 p. c. | ... | .... | .... | ... | .... | .... | .... |
| 3.25 " | Charged | 15,600 | .... | .... | ... | ... | .... | .... | ... | .... | .... | .... |
| 4.10 " | Analysis of bath and slag before tapping | .... | .... | .... | 0.19 | ... | .... | 0.016 | ... | 8.85 | 25.40 | 41.20 |
| 4.15 " | Finished heat. Ladle test | .... | .... | .... | 0.21 | 0.018 | 0.050 | 0.021 | 0.47 | .... | .... | .... |

Weight of ingots produced, 92,290 pounds.
Weight of scrap, 500 pounds.
Time from commencement of charging to tapping of heat, 4 hours 33 minutes.

with those specified as wanted in the rolling mill department, a column has been inserted in the table showing the various carbons desired in the case of each cast.

A few of these charges have been mechanically tested with the following results:

| Test cut from— | Melting Number. | Elastic limit. Lbs. per sq. inch. |
|---|---|---|
| 6 x 6 x 7/16 inches | 12,672 | 32,000 |
| 6 x 6 x 5/8 inches | 12,673 | 34,340 |
| 6 x 6 x 7/8 inches | 12,675 | 35,530 |
| 6 x 6 x 3/4 inches | 12,676 | 36,800 |
| 6 x 6 x 13/16 inches | 12,679 | 33,200 |

| Ultimate strength. Lbs. per sq. inch. | Elongation in 8 inches. Per cent. | Reduction of area. Per cent. | Analysis. Carbon. | Phosphorus. | Manganese. | Sulphur. |
|---|---|---|---|---|---|---|
| 58,500 | 27.75 | 57.0 | 0.16 | 0.028 | 0.56 | 0.047 |
| 59,820 | 28.5 | 44.3 | 0.17 | 0.030 | 0.44 | 0.046 |
| 57,050 | 30.0 | 53.0 | 0.16 | 0.037 | 0.46 | 0.048 |
| 59,100 | 29.0 | 47.8 | 0.19 | 0.024 | 0.40 | 0.049 |
| 57,430 | 29.0 | 48.9 | 0.16 | 0.027 | 0.56 | 0.062 |

The steel made in this furnace has ranged from 0.50 per cent. carbon down to dead soft material, and has been rolled into angles, channels, beams and all structural materials, and has also been worked up into axles and plates, with perfectly satisfactory results.

The full details of two of the charges made in this week are given in Tables B and C. From these it will be noted that the carbon in the liquid metal additions was rapidly eliminated during the reaction, and that the slag at the end of the heat was very low in iron oxide. In a few instances the slag was poured off on the charging side, as soon as the bath had quieted down, after the reaction following the introduction of the liquid pig iron. Charge 12,677 shows that the carbon calculated as present in the bath, after the addition of the first ladle of molten iron, was reduced in seven minutes to 0.44 per cent. from the theoretical 0.55 per cent. On the other hand charge 12,677 shows the calculated carbon to have been reduced from 0.46 per cent. to 0.15 per cent. in 27 minutes, proving that the reactions can be diminished or increased at will, and in cases where higher carbon steels are desired, as for rails and axles, such a metal can be easily obtained without first taking out the whole of the carbon and then recarburizing back to the desired extent.

### Using a High Percentage of Scrap.

Although during the week the author was at Pittsburgh the furnace was using all pig iron, except the scrap used in the filling heat, yet they have also worked most successfully there for a considerable period with a high percentage of scrap in the charge. The following synopsis of two weeks' work gives typical examples of this method of working, the percentage of scrap used being respectively 62 and 65 per cent. of the charge. This large proportion of scrap in the charge did not lead to an increased output for the week, which in work with the ordinary fixed furnace using solid material would, as is well known, have been the case.

| | Week ending September 27, 1902. Tons. | Per cent. | Week ending October, 1902. Tons. | Per cent. |
|---|---|---|---|---|
| Hot metal | 497 | = 36.9 | 472 | = 34.6 |
| Miscellaneous scrap | 803 | = 62.7 | 863 | = 65.0 |
| Swarth | 40 | | 25 | |
| Ferromanganese | 5 | = 0.4 | 6 | = 0.4 |
| | 1,345 | = 100.0 | 1,366 | = 100.0 |
| Cliff shaft ore | 10 | = 0.8 | 13 | = 1.0 |
| Limestone | 71 | = 5.4 | 69 | = 5.1 |
| Burnt lime | .. | | .. | |
| Ingots | 1,344 | = 99.7 | 1,353 | = 99.0 |
| Butts and scrap | 11 | = 0.8 | 1 | = 0.1 |
| Gain | .. | = 0.5 | Loss | = 0.9 |
| Number of heats | 28 | | 28 | |
| Average weight of heat | 48 tons. | | 48.3 tons. | |
| Average time of heat | 5 hours 45 mins. | | 5 hours 36 mins. | |

As will be seen, the yield obtained when using this high percentage of scrap in the charge is very good, but, of course, not equal to that which can be obtained when using all pig metal in the charge. To those, however, who are forced to use large quantities of light scrap in the charge, such as sheet mills, &c., there is a great advantage in being able at once to plunge this light scrap into a large bath of steel covered with a layer of slag, which prevents oxidation. As is well known when scrap is melted down slowly on the hearth itself a great waste through oxidation occurs.

### Sulphur.

In reference to sulphur in the continuous process, it will be noticed that, as in the ordinary basic open hearth process, there is no appreciable elimination of this element. The author considers that a large elimination of sulphur in the basic open hearth furnace is a very expensive operation, and has always been of opinion that the blast furnace and mixer are the proper places in which to eliminate sulphur, so that when the liquid metal arrives at the steel furnace there is no necessity to make an extra basic slag containing 50 per cent. and over of lime, and using with it fluorspar or calcium chloride. If, however, high sulphur material is used in the steel furnace, a highly basic slag can be made, but the output will be decreased, as is the case in the ordinary fixed furnaces, which, of course, adds considerably to the cost of making the steel. Again, if the metal treated is phosphoric, and the slag is sufficiently rich to be of value as a fertilizer, the question of the influence of fluorspar and calcium chloride in rendering a portion of the phosphoric acid insoluble in citrate of ammonia must be considered, as it reduces the commercial value of the slag.

### English Plants.

Although in England no furnaces are being erected of quite so large a size as the Pittsburgh furnace just described, we are in this instance not much behind. At Cardiff, at the works of Guest, Keen & Nettlefolds, Limited, a large furnace, rated at 160 tons, has just been completed, and most interesting results may be expected from it, as the pig iron employed there will be hematite. The Weardale Steel Company are erecting at Cargo Fleet, near Middlesbrough, a large plant to work the continuous process in connection with their new steel works, in which it is ultimately intended to have four large furnaces, rated at 175 tons. At present only two of these are being erected. In France, at the Senelle-Mabeuge Company's works at Longwy, arrangements have been made for the erection of two furnaces of the same size as those at Cargo Fleet.

### Results at Frodingham.

The first plant on this system erected in this country, by the Frodingham Iron & Steel Company at Frodingham, has now been in operation since January, 1902, and the fact that this company are now removing other fixed furnaces to make room for continuous furnaces is the best evidence that the author can offer as to the success of the process at these works. The furnace at Frodingham is one of 100 tons capacity; it worked during the whole of last year on molten pig iron, and during this period no repairs to the hearth were necessary, but the furnace stopped twice during the year for the necessary repairs to the side walls and ports. At the end of the year another stoppage for repairs was required, so that it may be said that the average campaign of such a furnace may be taken at from three to four months with phosphoric pig iron.

The average composition of the molten pig iron employed at Frodingham is: Silicon, 0.75 to 1.25 per cent.; phosphorus, 1.75 to 2 per cent.; manganese, 2 per cent.; sulphur, 0.06 per cent. The average weekly make of the furnace is now from 600 to 650 tons per week. This pig metal undoubtedly takes somewhat longer to work, owing to the high percentage of metalloids, than does such metal as that used at Pencoyd or at Pittsburgh. The yield, however, is very good, and the slag is higher in phosphoric acid than that obtained from heats working the same metal in fixed furnaces. It is found at Frodingham that the slag from the continuous process is some 3 or 4 per cent. higher in phosphoric acid than that from their ordinary furnaces.

The author submits that the results so far obtained at the Frodingham works are thoroughly satisfactory in every respect, especially when it is considered that all the molten pig iron is used direct from the blast furnaces, and that therefore pig iron of somewhat varying composition has had to be taken. It has

now been decided to erect a mixer at Frodingham, for use in conjunction with the continuous process, and this will enable a more regular supply of pig iron to be obtained, which in the author's opinion will lead to a considerable increase in the output from the continuous furnace. Two weeks' work from this 100-ton furnace are annexed, one taken early last year, soon after the process started, and the other taken in October, when more experience had been obtained.

During the week ending March 8, 1902, the following results were obtained from pig iron containing about 1.7 per cent. phosphorus:

| Metals used. | Tons. | Cwt. | Per ton of ingots. Cwt. |
|---|---|---|---|
| Scrap | 50 | 0 | 1.74 |
| Hot metal | 474 | 16 | 16.60 |
| Cold metal | 23 | 6 | 0.81 |
| Ferromanganese | 3 | 3 | 0.11 |
| | 551 | 5 | 19.26 |
| Ingots made | 572 | 3 | 2 = 103.81 |
| Ingots and scrap made | 584 | 0 | 2 = 106.0 |

To produce this amount of steel they used:

| | Tons. | Cwt. | Per ton of ingots. Cwt. |
|---|---|---|---|
| Iron oxides | 125 | 12 | 4.41 |
| Burnt lime | 43 | 4 | 1.51 |

The slag obtained weighed 121 tons, with an average composition of 9.4 per cent. iron and 16.53 per cent. phosphoric acid.

It will be seen both from the yield obtained and from the analysis of the slag that the reduction of iron from the oxide added must be very complete. Taking the average iron in the oxides at 70 per cent., this would give some 87.5 tons iron added as oxide, of which only some 11.5 tons were subsequently found in the slag, thus showing that some 76 tons were directly reduced from the oxides during the week. This confirms the yield, as say 500 tons were added as crude metal (pig) with 92 per cent. real iron and 50 tons as scrap at 99 per cent. real iron, which gives a total of 509.5 tons real iron added in the bath. The 76 tons directly reduced as above brings the calculated total weight to 585.5 tons, against 584 tons obtained by direct weighing.

*Week in October*, 1902.

| Charged. | Tons. | Cwts. | Qrs. | Cwts. per ton of ingots. |
|---|---|---|---|---|
| Scrap | 50 | 0 | 0 | 1.62 |
| Hot metal | 502 | 0 | 0 | 16.29 |
| Cold metal | 39 | 18 | 0 | 1.29 |
| Ferromanganese | 3 | 11 | 0 | 0.11 |
| | 595 | 9 | 0 | 19.51 |
| | | | | Per cent. |
| Ingots produced | 616 | 15 | 0 | 103.52 |
| Scrap | 7 | 16 | 0 | 1.35 |
| Total ingots and scrap | 624 | 11 | 0 | 104.87 |
| | Tons. | Cwts. | Qrs. | Cwts. per ton of ingots. |
| Scale | 134 | 19 | 2 | 4.38 |
| Pottery mine | 18 | 0 | 0 | 0.58 |
| Gellivare ore | 0 | 16 | 0 | 0.02 |
| | 153 | 15 | 2 | 4.98 |
| Burnt lime | 44 | 8 | 0 | 1.38 |
| Slag made | 130 | 8 | 0 | 0.21 |

### The Removal of Carbon.

When considering the problem of working liquid blast furnace metal, especially liquid hematite metal, in the open hearth furnace, one is forced to the conclusion that that process which will most rapidly eliminate the carbon is the one which will come into use. In fact, one may say that the solution of the problem of working liquid hematite metal in the open hearth nearly as rapidly as in the Bessemer converter must depend upon the speed at which the carbon can be removed from the molten metal by means of iron oxides, at the same time maintaining a temperature which permits of such rapid removal without freezing the metal. In the processes which have been proposed for employing in the basic open hearth furnace large quantities of oxides in conjunction with the use of molten pig iron, various disadvantages have presented themselves, which are fairly well known to those who have operated in this direction. When oxides are preheated on the hearth itself to such an extent as to melt them to a slag, there is, quite apart from the time which this necessitates, the well-known detrimental action which such scorification has upon the material composing the hearth. If, on the other hand, the oxide and lime added on the hearth be only partially melted some of the mass will more or less adhere to the furnace bottom, and a rapid filling up of the furnace will take place, so that its capacity is correspondingly reduced. It is also known that when liquid blast furnace metal is poured onto preheated oxides and lime, in a basic open hearth furnace, the average time required to bring the carbon down to about 1 per cent. is about six or seven hours (in the case of 40-ton charges), calculated from the time of charging the oxides. At the usual temperature of blast furnace metal when poured into such a preheated furnace, containing only oxides and lime, the slag formed rises into a foamy mass, and this frothy condition continues for hours. While the slag is in this condition the removal of the carbon is slow, owing to the insulating action of the thick layer of slag upon the surface of the bath. For the rapid elimination of the carbon heat must be imparted to the metal while the slag is in this foaming condition, and if to impart this necessary heat the layer of slag be poured off a great waste of iron oxide results, as this slag contains from 35 to 45 per cent. of ferrous oxide. Again, this slag has to be remade, although it is then made slowly, by charging in small solid additions, which allows the metal to pick up its heat while the formation of the necessary slag is going on. This is continued until the carbon is boiled down to the desired point.

In the continuous process, when making 40-ton heats in the 200-ton furnace by dilution alone, when the metal is brought up in two lots of 20 tons each, and boiled down between each addition, the carbon in the bath is never much above ½ per cent. This ½ per cent. is rapidly burnt out by means of the oxygen in the slag, which slag, as a rule, is not any richer than that which in the ordinary pig and ore process has to be run off. In the large bath of steel existing in the furnace we have a reservoir of heat, containing heat in excess of that required to maintain the bath of metal in a molten condition and to enable it to be cast into ingots without skulling. This excess of heat serves as a buffer in regulating the temperature in the furnace, which is lowered by the introduction of the molten pig iron, and to some extent by the dissociation of the iron oxides introduced.

The higher temperature which this state of things brings about in the furnace develops an entirely different reaction, as is evidenced by the surface of the bath. Instead of the frothy, seething condition, lasting unchanged for hours, a vigorous boiling reaction takes place, which settles down to a quiet condition within some 15 to 30 minutes. The bringing about of this "boiling" reaction, as distinct from the "seething" reaction, is essential to the quick reduction of the carbon, and the conditions necessary to insure a successful reaction are a sufficiently high temperature in the furnace, a slag containing excess of oxide, but at the same time not too great an excess, and by preference a bath low in carbon, which is found to be a condition most desirable for rapid carbon elimination.

As will be seen from the tables, so soon as the heat is cast from the furnace, and the furnace has been turned back, oxides, and lime when necessary, are charged into the slag existing in the furnace. The slag at this time, being low in oxide, rapidly absorbs that introduced, and by the time the men have finished fettling round the slag line it will be found that the slag is in a suitable state for the immediate addition of more pig metal. Therefore it is not necessary to delay the furnace solely for the purpose of heating up the requisite oxide and lime additions, as is the case when these are thrown directly into an empty furnace. The reaction is entirely under control when properly supervised. It may be necessary to vary the speed at which the pig iron is run in, and also to add lime to thicken the slag if this should be too thin, but the workmen soon learn to recognize these conditions.

At the temperature employed the carbon rapidly combines with the oxygen of the oxides in the slag, resulting in the evolution of great volumes of carbonic oxide, additional oxygen being supplied by the heated air from the regenerator, by which the carbonic oxide is rapidly burnt

to carbonic acid over the bath in the furnace itself, and also in the regenerators on the outgoing side of the furnace. As this undoubtedly occurs the heat evolved must certainly help to raise the temperature of the bath. Through bringing this into prominence the author has been criticised by H. H. Campbell of Steelton in his recently published work on "The Manufacture and Properties of Iron and Steel." In this most valuable book Mr. Campbell has devoted considerable attention to the continuous process, and although the author does not agree with his deductions, he recognizes the open mind which Mr. Campbell has brought to bear on the matter.

Mr. Campbell objects to giving the continuous process any credit for the heat evolved by the rapid combustion of the large volumes of carbonic oxide gas evolved during the reaction of the oxides upon the carbon of the molten metal run in. This seems to the author somewhat unfair, as in the case of the Tropenas process he states that the carbonic oxide evolved in the bath is burnt over the surface of the bath by a set of tuyeres, thereby creating much heat and rendering the steel itself much hotter. If he allows this to be possible in the one case, it seems contradictory not to allow it in the other, especially as, in the case of the open hearth furnace, the heat can be most completely utilized by being absorbed in the regenerators, which is not possible in the case of the converter.

### Capacity and Output.

Some amount of misapprehension has arisen on the subject of the capacity of these furnaces. It has been raised as an objection to the continuous process that, taking into consideration the size of the furnace employed, the output from it is little, if any, bigger than would be obtained from a fixed furnace of the same capacity. This, however, is an entire mistake, as the author hopes to show from the following considerations. The surface area at the bath level gives the best means of comparing the performance of one open hearth furnace with another of different size. The following table gives the surface area of several open hearth furnaces, three of which are working the continuous process. Taking the Pencoyd furnace, with a surface area of 30 feet by 9 feet, as the standard for a 70-ton furnace, the capacity of the others can be worked out as shown in the last column. It will be seen that while the three furnaces working the continuous process are fairly concordant, the others fall quite out of the running. For instance, the 50-ton Sharon furnace would be rated on this basis as a 100-ton furnace. The depth of the bath has not been taken into consideration in the above calculations, but the difference between any of the furnaces in question is comparatively slight. It is worth noting that the output per week seems to increase fairly proportionately with the surface area (for the same pig iron). Thus, taking the Pencoyd furnace again as the standard, from 270 square feet of surface area a weekly make of 650 tons is obtained; the Pittsburgh furnace, with a surface area of 640 square feet, should on the same basis produce some 1540 tons per week, which it bids fair soon to attain to, if it has not already done so before these lines are read. Their practice at Pittsburgh is rapidly improving, and there seems no reason to doubt that their make will speedily increase, as has been the case both at Pencoyd and Frodingham.

| Name of furnace. | Surface area. | Rated as Tons. | Capacity, taking Pencoyd furnace as standard. Tons. |
|---|---|---|---|
| Pencoyd | 30 ft. x 9 ft. 0 in. = 270 sq. ft. | 70 | 70 |
| Frodingham | 32 ft. x 12 ft. 6 in. = 400 sq. ft. | 100 | 104 |
| Jones & Laughlin | 40 ft. x 16 ft. 0 in. = 640 sq. ft. | 200 | *166 |
| Campbell basic furnace | 32 ft. x 10 (mean) = 320 sq. ft. | 50 | 83 |
| Donowitz basic furnace | 27 ft. x 10 ft. 0 in. = 270 sq. ft. | 30 | 70 |
| Duquesne basic furnace | 27 ft. x 14 ft. 0 in. = 378 sq. ft. | 50 | 98 |
| Sharon basic furnace | 29 ft. x 14 ft. 6 in. = 420 sq. ft. | 50 | 109 |

* The bath in this furnace is about 6 inches deeper than Pencoyd.

From the above it seems clearly a mistake to rate such furnaces as those at Sharon and Duquesne as 50-ton furnaces, if the Pencoyd furnace is to be rated as a 70-ton furnace. The authority for the above figures (except the continuous furnaces) is taken from Campbell's book already referred to.

## A New Blast Furnace Top.*

BY AXEL SAHLIN, MILLOM, CUMBERLAND.

One of the most important improvements in blast furnace construction achieved in the past was the substitution of the closed top for the open tunnel head, and the consequent saving for heat or power generating purposes of practically all of the gas produced in the furnace. During the era of low blast pressures, which yet prevails in this country, and with slowly working blast furnaces, the closed top, consisting of a cast iron hopper merely resting on the brick lining of the furnace, and held in place by gravity only, has answered fairly well. It is true that the top has occasionally been lifted by mild explosions, producing a pressure not greater than from 1 to 2 pounds per square inch inside of the furnace; the usual remedy being to put the hopper back into its old position, to grout up the cracks made by the explosion with a barrowful of clay, and, incidentally, to advise the Labor Insurance Company that one or two chargers were more or less seriously burned by an explosion. The next explosion may come in a week, or in a few months, or, with good luck, in a few years.

In endeavoring to utilize fine ore and to increase production, higher blast pressures must be employed, and slips occur more frequently. The hopper gives more and more trouble, and means have been sought for holding it in place. Brackets have been riveted to the inside of the furnace shell, to which the rim of the hopper has been bolted. This has prevented the lifting out of the hopper, but the brick work and floor plates surrounding it are exposed to periodical shocks and derangements, resulting in gas and air leaks and more frequent explosions.

The placing of explosion doors around the top of the furnace was the next step. These doors, however, cannot in practice be kept tightly closed. Gas continually leaks through the door openings as long as there is pressure on the tunnel head, and air will enter the furnace whenever a stoppage takes place. The explosion doors, therefore, create more explosions than they prevent, and are, when the escaping gas from time to time ignites, apt to cause serious damage to the structure of the furnace top.

To design a furnace top which will not admit air nor permit gas to escape, which can be easily and rapidly changed or repaired, which does not require the stationing of men on top of the furnace, which can be rapidly and mechanically filled without requiring a special operator to run the hoist, and which properly distributes the stock is, therefore, a problem of importance.

A solution is offered by the new Julian Kennedy furnace top, the reasons for the evolution of which I have endeavored to indicate in the above introduction, as they have presented themselves to me in the course of many years of personal experience.

It was in the latter part of 1901 that Mr. Kennedy placed the first of these tops on No. 2 furnace of the Iroquois Iron Works, near Chicago. In the year which has elapsed since then, 14 furnaces have been equipped, or are being equipped, with the new top, and in one instance at least a new automatic hoist of older type, which was lying ready to be erected, was scrapped, and a Kennedy arrangement substituted. This rapid introduction and experience recently gained enables me to speak about the theories of Mr. Kennedy as fully substantiated facts, and justifies me in now placing the new apparatus before the eminent scrutiny of the British Iron and Steel Institute, and in giving a brief description of the new furnace top.

The design of the new furnace top is based on the following now verified assumptions:

1. That explosions inside the furnace top do not take

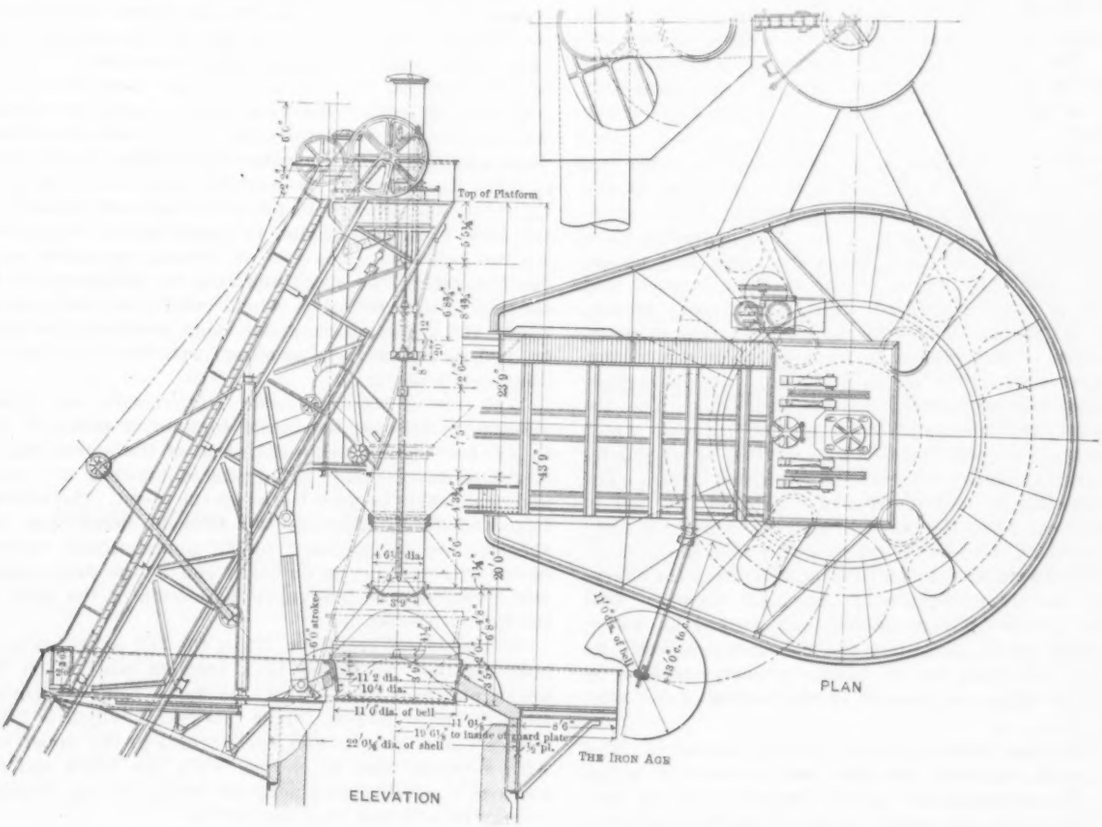
* A paper read before the Iron and Steel Institute.

place as long as air is prevented from mixing with the gas.

2. That even if an abnormally rapid combustion of the gas should take place, this will, with a hermetically sealed furnace top, result only in an increase of pressure and a gradual relief of it through the escape afforded by the downcomer and gas piping.

In practice it has been found advisable and sufficient to make all parts of the furnace shell, top and gas piping sufficiently strong to carry a pressure of 35 pounds per square inch.

The construction of the Julian Kennedy furnace top in shown by the accompanying drawing.




THE JULIAN KENNEDY FURNACE TOP AND HOIST.

*a. Furnace Top.*—The shell of the blast furnace is built in the manner customary in Great Britain and America, with a shell of steel plates resting on columns. The vertical rivet seams are double riveted, and the whole structure is calked air tight. The top of the furnace shell is contracted, ending in a frustum with sides inclined at an angle of about 45 degrees. The top of this frustum is just of sufficient diameter to permit the lowering of the bell through the central opening, which is finished off with a heavy angle ring of wrought metal or steel casting. About 8 feet below the base of this frustum inside the furnace a heavy angle ring is riveted to the shell; this ring supports a 15-inch wall of special, very dense fire brick, which protects the iron work from the internal heat. This upper protecting wall is exposed to no wear and tear, and does not need to be removed when the furnace is being relined.

Inside of the protecting wall the lining of the furnace expands freely. To minimize the wear caused by the stock striking the lining, brick-shaped blocks of white iron are placed at intervals between the bricks of the inner course.

The gas is taken away from the furnace top by four gooseneck-shaped downcomers, which unite downward into two self-cleaning gas mains conveying the gas into the dust catcher. The entire top is hermetically closed, no explosion doors being fitted either to the furnace shell or to the downcomers.

*b. The inclined hoist* supports two tracks and is formed by three latticed girders firmly bolted to their foundation at the bottom of the furnace. The top of the hoist incline is connected with and supported from the furnace shell by two vertical, pin-connected struts. The top ends of these struts rest in bearings riveted to the under side of the hoist girders; their bottom ends rest in shoes of cast steel riveted to the base of the top frustum of the furnace shell on the side nearest the hoist. These struts form the only connection between the independent inclined hoist and the furnace proper.

*c. Platforms.*—Above the bearings holding the struts to the hoist incline the latter extends upward supporting in a central position above the furnace a strong platform which carries the cylinders for working the bells as well as the main sheaves for the hoist cables. This platform is provided with suitable handrails and ladders, and forms a convenient floor for the attendants who look after the hoist and the cylinders.

A second platform is placed around the furnace top near the top of the frustum. It is used only when changing bells or when looking after the various parts of the charging apparatus. No men are permanently stationed on either of the top platforms.

*d. Charging Bell and Hopper.*—The cast steel seal ring for the bell is bolted to the heavy angle which surrounds the contracted top of the furnace. It is built narrow, so that its lower edge barely extends below the 15-inch brick lining protecting the top. Lifted against the lower edge of this ring we find the main charging bell of the ordinary Parry type cast in steel. This bell is operated by a central bell rod directly connected by suitable pins and rod with the central lifting cylinder. In the flange of the seal ring between the bolts holding the same to the top of the furnace are pockets in which rest the heads of other bolts connecting it with the superimposed conical stock hopper. This hopper is built of steel plates and is provided with doors, fitted with hinges and locks, and intended to give access to the interior of the hopper when required.

*e. Receiving Cylinder and Bell.*—The top of the inverted hopper is fitted with an angle ring, on which rests the cast steel seal ring for the distributing bell, which latter is a smaller Parry bell suspended from a tube working outside of the central rod of the charging bell.

Above this smaller bell is placed the central cylinder for receiving the stock, which is of same construction as those to-day used on all the modern American furnaces. It has been found that, if rightly proportioned, this central cylinder gives an entirely satisfactory mixture and distribution, even though many kinds of ore are used in one charge. The top of the receiving cylinder is finished off as an oblong hopper, the skips delivering the stock into this hopper on either side of the bell rod. The quantity of each material entering into one round is divided into an odd number of skips. So, for instance, is every round of limestone divided into three skips. In the first round two charges of limestone are delivered by the left hand, and only one by the right hand skip. In the next round two skips of limestone are raised by the right hand skip to one by the left hand. The same arrangement is observed in charging ore and coke. The use of this distributing apparatus is too general on the best and most successful American furnaces to admit of any doubt as to its satisfactory working.

*f. Cylinders Working Bells.*—The main charging bell is, as stated above, lifted and held in position by one central plunger-packed cylinder, worked by water, or in cold climates by soda water or oil. The hydraulic valve is operated by light wire ropes from the foot of the hoist incline. The length of the cylinder is such that the bell is given a drop of about 2 feet, more or less, before the plunger bodies in the bottom of the cylinder. The stroke of the cylinder is, however, about 6 feet long, the upper part of the stroke being used, in the manner explained further on, only for changing bells. The distributing bell, suspended from a tube through which the central bell rod slides, is also worked by a cylinder through the agency of a counterweighted lever. The counterweight is sufficiently heavy to hold the bell in position even when the central receiving cylinder is filled with material. The power cylinder only lifts the counterweight and permits the bell to drop, delivering the charge around the circumference of the main hopper. This cylinder is also plunger-packed and worked by water, soda water or oil, according to local circumstances. Its valve is, like that for the main cylinder, operated by the charger from his position at the bottom of the hoist incline.

*g. The main sheaves* for the hoist cables rest in pillar blocks with swiveled bearings and automatic oiling rings. The pedestals are securely bolted to the top platform. The skips are hauled upward by bails fastened to the hoist ropes and turning upon pins riveted to the outside of the skip near the bottom. The front wheels of the skip are ordinary railway wheels gauged to fit the main track of the hoist. The rear wheels each consist of two railway wheels, the inner pair gauged the same as the front wheels to fit the main track, the outer ones gauged to run on short sections of curved track near the top of the hoist, so bent that these outer wheels mount on the same, tilting the skip and discharging its contents into the hopper at the top of the receiving cylinder. The skips are lined with steel plates, which can be readily renewed when worn.

The only parts of the hoist exposed to wear are the cables, main sheave bearings and skips, for all of which spares can conveniently be kept on hand.

*h. The hoisting engine* is entirely automatic. The only manual operation necessary is the starting of the engine, and, of course, the usual periodical attention and supervision necessary for all classes of machinery, such as oiling, packing and adjustment of bolts, joints, bearings, &c.

The hoist is driven either by steam or electricity. The latter power results in a saving of from 30 to 40 per cent. of steam, but, on the other hand, the cost of the electric outfit is about double that of the steam engine. The choice of power is, therefore, reduced to a local question, depending on the value of steam, the length of steam piping required, and, on the other hand, the capacity, position and arrangement of the electric generating plant available. Both types of engines work with equal reliability and promptness.

*The steam hoisting engine* is of the two-cylinder, inverted, vertical type, driving by gears a jack shaft supporting the two rope drums. The valves are placed in a central steam chest connecting the cylinders. They consist of two piston valves and a central distributing, throttling and reversing valve of unique and ingenious construction.

The hoist drums are grooved for double wire cables, and are connected by a spool of such length that the ropes lead fairly and directly from the main hoist sheaves on to the drums.

The driving gear consists of an inverted steel spur wheel bolted to the drum and a machine cut steel pinion keyed to the crank shaft, which also carries a powerful automatic band brake.

The engine once in motion, the throttle valve is regulated by a system of shafts and levers worked from an eccentric cam driven by a gear on the outboard end of the drum shaft. This end takes the shape of a heavy, square threaded screw, on which are clamped two adjustable lock nuts. Between these a loose nut travels without turning until it engages with one of the lock nuts, and thereby is compelled to revolve. In so doing it turns the gear and the eccentric cam, which throttles the steam and finally cuts off both steam and exhaust, at the same time as it applies the band brake. By adjusting the lock nuts, the action of the cam is readily regulated to retard the speed and stop the skips exactly at the points desired. The whole controlling gear, being heavy and direct in its action, may positively be relied on, and all button ropes or other auxiliary safety devices dispensed with.

*The electric hoisting engine* is fitted with rope drums similar to those of the steam engine. A motor of 120 to 150 horse-power takes the place of the steam engine. A geared countershaft is introduced between the crank and drum shaft in order to reduce the speed. The electric stop and safety devices, the solenoid brake and the rheostat are all governed by an automatically worked device attached to the outboard end of the drum shaft, which retards and interrupts the motion of the hoist at the points desired.

*i. A swinging crane* for lifting the bell or seal ring, or both together, is placed in a suitable position on the lower platform, the top of the same being supported from the hoist incline. Over this crane, which is fitted with sheaves, runs a wire rope, armed at the upper end with a strong hook or clevice, while the lower end extends to a winch placed near the bottom of the furnace, or may be attached to a locomotive.

*j. The changing of the bell* is done in the following manner:

1. The tube working the small stock bell is clamped to the main bell rod.

2. The bolts holding the main seal ring to the top of the furnace shell are removed.

3. Water is turned onto the main cylinder operating bell. This is now worked to its full stroke, lifting bell, seal ring, hopper and stock cylinder upward until the lower edge of the bell is above the top of the furnace shell.

4. Two rails kept handy on the lower top platform are slid under the bell, which again is lowered until it rests on them.

5. The pin coupling the bell to the bell rod is now readily reached and removed through the doors of the hopper.

6. Water is again turned on the central cylinder, which this time lifts the seal ring, hopper and stock cylinder, leaving the bell standing on the rails.

7. The crane is swung round and coupled to the bell, which is moved sideways, lifted from the rails, swung clear of the furnace and lowered to the ground.

8. The worn out bell is now detached from the wire rope, the new bell to be put in place is coupled onto the rope, hoisted to the furnace top, slid onto the rails, and placed in a central position under the suspended hopper.

9. The hopper is lowered onto the new bell until it rests on the same. The pin connecting the bell rod to the new bell is put in place.

10. Water being again turned onto the central cylinder lifts the bell, seal ring, hopper and stock hopper clear of the rails.

11. The rails are removed and the new bell, with seal ring, hopper and stock hopper, are lowered into their permanent position.

12. The holding down bolts are replaced and the tubular bell rod is unclamped from the central bell rod. The furnace is now ready for operation.

The time required in practice for the furnace crew of eight men to change bell varies from two to three hours. Any furnaceman who, like the writer, has worked a furnace for six months with a bell of unsuitable size for distributing the ore, which he is at the time compelled to work to avoid the loss of time which would be incurred in dismantling the charging gear and changing bell, will join in recognizing the enormous importance of being able rapidly to replace this important part of the furnace mechanism.

*k. The advantages claimed for the new furnace top* are:

1. The freedom from explosions as proven by practice; no air entering into the furnace.

2. Absence of gas leaks and dust around the furnace top.

3. Simplicity and durability of construction.

4. Rapidity and cheapness of the operation of changing bells and seal rings.

5. The automatic working of the hoist, which requires no attendants on top and no hoist engineers, thus saving on a medium size furnace the labor of nine men. The weighman or the man operating the electric charging larry has sufficient time also to operate the hoist and bells.

6. The cheapness of the construction as compared with other modern hoists now in use.

## Notes from Great Britain.

### The Markets.

LONDON, May 2, 1903.—Very little need be said of the markets this week, for the simple reason that not much is doing. Consumers are still buying from hand to mouth, and prices are undoubtedly sagging. The general tendency is downward. The present position broadly is that smelters have enough orders to go on with and are therefore under no immediate need to press business. In the Midlands this is especially true, inasmuch as the production of iron about balances consumption. But the smelters have the summer before them and are naturally a little anxious.

That prices are holding up as well as they do is mainly due to absence from the market of foreign competition. There have been rumors this week of a return of German offers, but I can trace them to no authentic source. In standard prices interest is centered round the Strip Makers' Association. Owing to severe competition it was anticipated that at the Birmingham meeting last Thursday there would be a reduction in the standard, and ½ crown was openly mentioned as the amount of the reduction. The official statement, however, is that action was deferred, although the advisability of taking measures to meet outside competition was seriously considered. Stocks to-day are as follows:

| | |
|---|---|
| *Pig Iron:* Connal's at Glasgow, April 30 | 18,014 |
| Connal's at Middlesbrough, hematite | 300 |
| Connal's at Middlesbrough, April 29 | 138,885 |
| Hematite, West Coast | 26,790 |

*Finished Iron:* Marked bars, £8 10s.; Earl of Dudley's brand, £9 2s. 6d.; second grade, £7 10s.; common unmarked bars, £6 5s. to £6 10s.; North Staffordshire bars, £6 15s.; angles, £6 15s. to £7; sheets, singles £7 10s. to £7 12s. 6d., doubles £7 12s. 6d. to £7 15s., trebles £8 5s. to £8 7s. 6d.; galvanized corrugated sheets, f.o.b. Liverpool, £11 10s.; hoop iron, £7 5s.; nail rod and rivet iron, £7 5s. to £7 10s.; gas strip, £6 12s. 6d. to £6 15s.

*Steel:* Bessemer Billets, £4 17s. 6d. to £5; Siemens billets, £5 to £5 2s. 6d.; mild steel bars, £6 12s. 6d. to £7 2s. 6d.; steel plates, £6 5s. to £7; steel girders, £6 to £6 5s.; steel angles, £5 15s. to £6 7s. 6d.

### Railroad Developments.

Particulars of railroad projects in British India can be found in the *Gazette of India* for March 18. After providing for the requirements of "open lines" and "lines under construction," the programme for "new construction" provides for an expenditure of 55,94,000 rupees in the forthcoming year, on the following projects:

1, Jech-Doab (southern section); 2, Bengal-Nagpore, including the Gondia-Chanda and the Brahmapuri-Nagpur extension; 3, Lower Sind extension of the North Western Railway; 4, Hapur-Meerut; 5, Rameswaram extension of the South Indian Railway.

The memorandum on the construction of railways shows that, after making allowance for corrections of mileage, the total length of open line at the end of the fiscal year 1902-03 would be 26,471 miles. The mileage under actual or impending construction on April 1 last was 2371 miles, making a grand total of railways completed and in hand at the commencement of 1903-04 of 28,842 miles.

It is expected that 654 miles will be opened for public traffic in 1903-04, leaving 1717 miles for completion in 1904-05 or later.

From India to South Africa is a far cry, but railroad development is there the order of the day. The South African Railway Commission, which has recently been sitting, has before it a great number of railroad projects, extensions and improvements. Since the termination of hostilities the Central South African railways doubled their traffic, compared with any previous period in their history. Lines for construction by private enterprise in South Africa at the present moment are: 1, Sanna's Post-Wepener; 2, Maseru-Langerwacht, via Leeuw River Mills; 3, Ermelo-Standerton or Ermelo-Volksrust; 4, a line connecting the Murchison gold fields with one of the existing lines.

### Locomotives for Japan.

In connection with the subject of railroad construction, I hear that an agent of the Japanese Government is on his way to this country to place orders for a large number of railway locomotives. It is stated that he was sent to the United States with a view to placing a portion of the order, but that American firms could not complete and deliver within a specified time. He is therefore to arrange the whole of the transaction with British manufacturers.

### Oil Fuel.

Some time ago, it will be remembered, the two navy ships "Mars" and "Hannibal" were fitted with oil furnaces. The result, however, was not good, and the authorities have decided now to continue the experiments on the destroyer "Surly." The "Surly" has for some years been devoted to these trials and fair success has been achieved. Experts are still confident that oil will become the fuel of the navy. It must be admitted that oil is not being very rapidly adopted by the railway companies, in spite of the satisfactory results which the Great Eastern Railway Company are said to have obtained. At present oil fed locomotives seem to spend a large proportion of their powers in pouring forth black smoke and causing their proprietors to appear at the police courts.

### Pipe Line in Roumania.

The Roumanian Ministry of Finance intends shortly to apply for the grant of a sum of money out of the Budget reserves to provide for the study in detail of the scheme for a pipe line from the petroleum deposits at Baicriu, Province of Prahova, to Cernavoda-Constantza. As the prospective line would be over 150 English miles in length, its construction would require large quantities of iron piping, which will have to be procured from foreign countries.

### The Russian Metallurgical Industry.

Mine owners of the Krivoi Rog basin are said to have sold 10,000,000 poods of ore to Silesia, and 7,000,000 to Germany and England, to be exported via Nicolaeff. Russian manufacturers and metallurgists spare no efforts to do something to revive the metallurgical industry, the position of which lately has been very critical, most of the works only barely exisiting on Government orders and subsidies. Many persons understanding the hopeless position have been induced thereby to advocate complete withdrawal of all Government help and the introduction of free competition, so that unhealthy undertakings may suffer a natural collapse and the position be cleared.

### Tramways Without Rails.

Parliamentary powers are being sought to construct an electrical tramway to be worked on the overhead trolley system with double wires, but without rails laid

on the ground, from Stroud, in Gloucestershire, to Cheltenham, Stonehouse, Nailsworth and Chalford. Allan Campbell Swinton, an electrical engineer, in giving evidence before the Parliamentary committee, expressed his opinion that the proposed tramways would be extremely beneficial, not only from a commercial point of view, but to meet the demands of the inhabitants for better transport facilities. It is proposed to work the tramway first with trolley omnibuses, but it is hoped later to adopt the ordinary mode of tramway construction. S. G. H.

## Shelby Iron Company.

The annual report of President T. G. Bush of the Shelby Iron Company of Alabama has just been issued. It covers the fiscal year ending March 31, 1903. The following extracts from it will be interesting to our readers, as the company are manufacturers of charcoal pig iron exclusively, and there are few companies engaged in this special branch of industry whose operations are given to the public:

BALANCE SHEET.

*Assets.*

| | |
|---|---|
| Cash at Shelby, in vault and in bank | $12,155.59 |
| Cash with treasurer | 126,359.41 |
| Bills receivable at Shelby | 175.07 |
| Accounts receivable at Shelby | 1,066.48 |
| Accounts receivable for pig iron shipped | 148,845.79 |
| Pig iron on yard at Shelby, 603 tons | 7,240.41 |
| Merchandise in commissary at Shelby | 12,719.50 |
| Merchandise in commissary at Fenwood | 2,095.26 |
| Merchandise in commissary at Kalona | 827.72 |
| Iron ore on hand | 4,250.00 |
| Limestone on hand | 315.00 |
| Charcoal at furnaces | 33,407.23 |
| Charcoal and wood at coalings | 21,406.22 |
| Ore bank tools and supplies | 1,985.05 |
| Charcoal tools, ovens and outfits at coalings | 9,291.63 |
| Furnace and yard tools and supplies | 2,632.29 |
| Furnace repair material (brick and castings) | 3,493.18 |
| Repair material at shops and water works | 3,607.67 |
| Live stock, wagons, carts, harness and feed | 6,551.69 |
| Two furnaces, with buildings and machinery | 234,000.00 |
| Ore roasters and conveyors at furnaces | 14,500.00 |
| Washer plants, including steam shovels | 25,000.00 |
| Narrow gauge track and equipment, ore bank | 27,961.59 |
| Broad gauge track and equipment, yard | 27,522.02 |
| Broad gauge railroad track scales | 2,000.00 |
| Buildings and appliances at rock quarry | 2,381.85 |
| Shop buildings, machinery and tools | 16,000.00 |
| Electric light plant | 1,500.00 |
| Stable building | 2,025.97 |
| Water works | 64,133.62 |
| Furniture in offices at Shelby and Birmingham | 1,165.00 |
| Store, warehouse and dwellings | 35,973.33 |
| Lands, cleared, timber and ore | 301,061.01 |
| Timber rights | 8,170.00 |
| Improvements under construction | 4,155.76 |
| Shelby Mfg. & Improvement Company stock | 150,000.00 |
| Eumawhee Mining Company stock | 16,000.00 |
| Total | $1,331,975.34 |

*Liabilities.*

| | |
|---|---|
| Accounts payable | $6,597.03 |
| Pay rolls payable | 8,769.73 |
| Hospital | 2,376.64 |
| Capital stock | 1,000,000.00 |
| Surplus | 66,095.86 |
| Profit and loss | 210,413.74 |
| Stumpage, wood used from lands and timber rights | 14,975.38 |
| Ore royalty | 13,191.00 |
| Prospective furnace repairs | 9,555.96 |
| Total | $1,331,975.34 |

During the year there was charged for stumpage for wood taken from the company's land $3,506.94, and for wood taken from timber rights $4,976.74, making a total of $8,483.68, which entered into the cost of charcoal.

During the year 25 cents per ton of iron made was charged into the cost of iron for extraordinary or prospective repairs. This account showed at the close of the fiscal year a credit of $9,555.96. Out of this will be charged the extraordinary repairs in relining No. 1 furnace, which was not completed before the end of the fiscal year.

IRON STATEMENT.

| | | |
|---|---|---|
| On hand at Shelby, April 1, 1902 | 47 | |
| Made for year 1902-03 | 37,220 | |
| | | 37,267 |
| Shipped from yards during the year | 36,551 | |
| Used at foundry | 113 | |
| | | 36,664 |
| Balance on hand March 31, 1903 | 603 | |

The iron on hand was applicable to sales already made, but was not shipped promptly for lack of cars. The present condition of our order book enables us, when cars are available, to practically keep the yard clear of iron.

PROFIT AND LOSS ACCOUNT.

*Credit.*

| | | |
|---|---|---|
| April 1, 1902. | | |
| By balance | | $132,386.62 |
| March 31, 1903. | | |
| By gain on pig iron for year | $232,952.17 | |
| By profit on Shelby commissary | 8,461.50 | |
| By profit on British commissary | 2,842.86 | |
| By profit on Kalona commissary | 1,873.33 | |
| By rents received, less repairs | 1,154.52 | |
| By interest | 3,926.26 | |
| | $251,210.64 | |

*Debit.*

| | | |
|---|---|---|
| To legal expense | $215.35 | |
| To land expense | 210.67 | |
| To prospecting for ore | 92.13 | |
| To St. Albans Foundry Company | 604.85 | |
| | 1,123.00 | |
| Net gain on operation for year | $250,087.64 | |
| To depreciations: | | |
| Furnace No. 1 | $4,253.43 | |
| Furnace No. 2 | 1,253.42 | |
| N. G. track and equipment | 1,849.97 | |
| B. G. track and equipment | 337.04 | |
| Washer plants | 2,043.46 | |
| Railroad track scales | 198.09 | |
| Ore roasters and conveyors, Furnace No. 1 | 100.00 | |
| Ore roasters and conveyors, Furnace No. 2 | 464.01 | |
| Electric light plant | 687.10 | |
| Limestone buildings and appliances | 1,000.00 | |
| | 12,186.52 | |
| | | 237,901.12 |
| | | $370,287.74 |
| To two dividends paid during the year (declared $160,000) | | 159,874.00 |
| March 31. By balance | | $210,413.74 |

The depreciations on the different plants are charged arbitrarily as a matter of good business policy, although it is understood that no separate sinking fund is provided covering these charges. Our improvements for the year have been somewhat larger than on the average, owing to addition to boiler power and extraordinary repairs having been made in part on both furnaces, together with expenditures for additional track and equipment and completion of water works plant, in keeping with the original plans. The water works improvements consist chiefly of additional pump and reservoir, which guarantee against failure of supply of water for the furnaces and washers.

*Available Assets.*

| | |
|---|---|
| Cash at Shelby (in vault and in bank) | $12,155.59 |
| Cash with treasurer | 126,359.41 |
| Bills receivable | 175.07 |
| Accounts receivable | 149,912.27 |
| Pig iron on yard | 7,240.41 |
| Merchandise in commissaries | 15,642.48 |
| Furnace stock, including ore, charcoal, limestone and wood at coalings | 59,378.45 |
| | $370,863.68 |

*Current Liabilities.*

| | |
|---|---|
| Accounts payable, current expenses, &c | 17,743.40 |
| Net available assets | $353,120.28 |

LANDS.

March 31, 1903.

| | | |
|---|---|---|
| 1,517 | Acres ore lands, 1902 | $206,908.36 |
| 906 | Acres in coal measures | 4,531.10 |
| | Mineral rights reserved on 10,602 acres. | 2,241.00 |
| | 12,833.294 acres original growth timber lands, 1902 $41,101.73 | |
| | 884.540 acres bought for 1,400.00 | |
| | 13,717.834 acres $42,501.73 | |
| | 128.860 acres sold for 353.20 | |
| | 13,588.974 acres $42,148.53 | |
| | 1,168.980 acres timbered land cleared 4,675.92 | |
| 12,419.994 | acres original timber lands | 37,472.61 |
| 10,000.000 | acres second growth timber lands | 25,000.00 |
| | 11,189.706 acres cleared lands, 1902 $9,377.50 | |
| | 27,510 acres bought 1,000.00 | |
| | 1,168.980 acres cleared 1,168.98 | |
| 12,386.196 | acres cleared lands | 11,546.48 |

| | | |
|---|---|---|
| Lot 18, block 118, Shelby, Ala. | $122.31 | |
| Wilson lot, Columbiana, Ala.. | 200.00 | |
| Mardis lot, Columbiana, Ala.. | 100.00 | |
| | | 422.31 |
| 37,229.190 acres | | $288,121.86 |
| Ledger account "Lands" shows | $301,061.01 | |
| Ledger account "Stumpage" shows wood cut from timber lands | 12,939.15 | |
| Making inventory "Lands" as above | $288,121.86 | |
| *Timber Rights.* | | |
| Original acreage cost | $8,170.00 | |
| Less timber cleared | 2,036.23 | |
| | | $6,133.77 |
| Ledger account "Timber Rights" shows | $8,170.00 | |
| Ledger account "Stumpage" shows | 2,036.23 | |
| | | $6,133.77 |

As to the supply of timber for charcoal, we are purchasing from time to time such timber lands as we may find available. It is well known that pine timbered lands in all sections of the country have greatly enhanced in value. This, of course, will tend in the future to higher cost of fuel.

Furnace No. 1 was in operation during the fiscal year, with the exception of the month of March, when it was blown out for relining. The work on this furnace has been completed, with decided improvements over what it was heretofore. I think its capacity and efficiency have been improved, and I regard it in its present condition probably the best charcoal furnace in the South.

Furnace No. 2, as stated in the last report, was blown out for repairs December 4, 1901. It was not blown in for reasons previously stated until the first week of May, 1902. It has been in continuous operation since that time, and is now showing a material increase in output over its previous results.

As is well known, the iron market generally was active the fiscal year, prices reaching a maximum beyond the expectations of any one. The prices which at one time seemed reasonable and fair, and at which we sold a large percentage of our output, later appeared comparatively low; although taking the year as a whole, we secured fairly good average prices. The market for iron for future delivery, covering the first and second half of the present calendar year, has been good, so that we have been able to sell at good prices a large percentage of our prospective output for the remainder of the year 1903. We expect from the condition of our furnaces that our output for the present fiscal year will be increased; and, therefore, we will probably have an additional quantity of iron to offer over and above the sales already made.

During the year just closed two dividends were paid, one 6 per cent. and one 10 per cent., in the months of April and November, 1902. A further dividend has been declared, payable May 15, 1903.

I take pleasure in testifying to the general faithfulness and efficiency of the employees of the company during the fiscal year.

## New Publications

**The Manual of Statistics, 1903.** Pages, 1044. Price, $5. Published by the Manual of Statistics Company, 220 Broadway, New York City.

This is the edition for this year of a stock exchange hand book which has for some time been issued annually. The present issue has been largely increased in size as compared with previous years. It contains a great variety of information relative to all classes of securities, every effort having been made to furnish the most complete and trustworthy details regarding the organization, history, capital, bonds, earnings and other desired data of railroad companies, industrial corporations and miscellaneous companies whose securities are dealt in on the exchanges of the great cities of the United States and Canada. A great deal of the space is necessarily devoted to railroad securities, but no less than 494 pages are required for the presentation of information relative to the organization, business activities and financial conditions of industrial and miscellaneous corporations. It is asserted that this imposing array of what has been done in the great industrial movement in this country will be a revelation to the general public and scarcely less so to the observing student of public affairs. Other features of the work are stock and bond quotations, summaries of the bonded debt of the United States and various foreign governments, tabulated information relative to all kinds of produce dealt in on the exchanges in the large cities and voluminous statistics relative to mining companies. It has been the aim of the publishers of this work to make it the recognized standard statistical authority.

**Notes on Track Construction and Maintenance.** By W. M. Camp, editor of the *Railway and Engineering Review*. Pages, 1214. Illustrated. Published by the author at Auburn Park, Chicago.

This work, which is encyclopedic in its scope and character, treats of the construction and maintenance of railroad track from the standpoints of both the trackman and the engineer. A great deal of the matter which it includes was published as a series of articles in the *Railway and Engineering Review*, covering a period of about three years. This afforded excellent opportunities to enlarge upon the original scheme as well as to profit by the criticism of readers upon the matter thus published serially. As revised for the final appearance of the articles in book form, the volume of matter has been increased by about 70 per cent. The author states that it has been his constant aim to follow practice down to date and to give reference to all new improvements which seem likely to assume future importance. One particular object in view has been to cover as widely as possible the development of labor saving machinery. The contents are divided into 12 chapters, having the following headings: Track Foundation, Track Materials, Track Laying, Ballasting, Curves, Switching Arrangements and Appliances, Track Maintenance, Double Tracking, Track Tools, Work Trains, Miscellaneous and Organization. The information given under each of these headings is very minute in details, drawings being given wherever necessary to explain a subject, and numerous illustrations also being used to set forth the exact character of the work under discussion. The book is not so technical but that it will be found thoroughly intelligible for any trackman, while the information given is so complete and exact as to be useful to the engineer.

**Directory of Directors in the City of New York for 1903.** Pages, 1124. Published by the Audit Company of New York, 43 Cedar street, New York.

This is the fifth annual edition of a publication which has met with much favor, as the list of names which it contains covers the leading capitalists of this great financial center. The names are arranged alphabetically, each accompanied by the New York City address and followed by the names of the companies with which each person is connected. An appendix gives selected lists of corporations in banking, insurance, transportation, manufacturing and other lines of business; also alphabetically arranged and accompanied in each case by the names of the company's principal officers and all their directors or trustees. The list of manufacturing corporations is a long one, indicating the importance which New York City has acquired as the headquarters of great interests in this line

The internal dissensions of the sheet metal workers' unions have been settled, an agreement having been entered into at Milwaukee on May 6 whereby the name of the international body is changed to the Amalgamated Sheet Metal Workers' International Alliance. The Chicago Local Union, No. 73, is recognized as the *bona-fide* union, and charter No. 275 is revoked. The alliance unions at Chicago, Pittsburgh, Philadelphia, New York and Newark, N. J., have become affiliated.

John P. McCrea, formerly in the sales department of the American Sheet Steel Company at Pittsburgh, has resigned his position, taking effect June 1 next.

# The Iron Age

**New York, Thursday, May 14, 1903.**

DAVID WILLIAMS COMPANY, - - - - - - - - PUBLISHERS.
CHARLES KIRCHHOFF, - - - - - - - - - EDITOR.
GEO. W. COPE, - - - - - - - - - - ASSOCIATE EDITOR.
RICHARD R. WILLIAMS, - - - - - - - - - HARDWARE EDITOR.
JOHN S. KING, - - - - - - - - - - BUSINESS MANAGER.


## Currency Elasticity in Operation.

As it is given out, apparently on the authority of a subcommittee of the Senate Finance Committee, that "the committee will not present any experimental propositions," that asset currency or credit currency may be discussed in the committee, "but it is not likely that the Senate Committee will incorporate any feature of theoretical finance," it is worth while to look at the asset or credit currency of Canada, and the way it meets the needs of business.

The following table shows the bank currency of Canada on the dates when it is usually largest and smallest for the past six years:

| Date. | Amount. | Percentage of change from previous date. Increase. | Decrease. |
|---|---|---|---|
| January 31, 1903 | $55,042,987 | ... | 16.5 |
| October 31, 1902 | 65,928,973 | 35.7 | ... |
| January 31, 1902 | 48,586,529 | ... | 16.2 |
| October 31, 1901 | 57,954,779 | 28.7 | ... |
| January 31, 1901 | 45,025,306 | ... | 15.3 |
| October 31, 1900 | 53,198,777 | 28.7 | ... |
| January 31, 1900 | 41,320,083 | ... | 16.6 |
| October 31, 1899 | 49,588,236 | 34.3 | ... |
| January 31, 1899 | 36,916,579 | ... | 13.2 |
| October 31, 1898 | 42,543,446 | 21.5 | ... |
| January 31, 1898 | 35,011,722 | ... | 15.8 |
| October 31, 1897 | 41,580,928 | 37.6 | ... |
| January 31, 1897 | 30,208,157 | ... | ... |

Here is a currency that increases every year, with the growth of population and business. From October, 1897, to October, 1902, the increase was nearly 60 per cent. Here is a currency that increases every fall, in the crop moving season, and contracts every winter as soon as the special need of currency subsides. It is idle to talk of "theoretical finance" when this growing and elastic currency has been in existence for many years across our northern boundary.

Our bank currency decreased for ten years, while population and wealth were increasing. In later years there has been an increase, but this is due in great measure to new legislation three years ago. The increase of circulation is irregular, and bears no relation to the recurrence of the seasons. It sometimes increases in the spring and decreases in the fall. Notably in two autumns when the Treasury was endeavoring to relieve the monetary stringency many of the banks were retiring their circulation in order to sell their bonds at high prices. In three of the last 13 years the bank currency decreased between August 1 and December 1. In only three of the years was the increase as great as $10,000,000. In 1901 the increase during the crop moving season was only a couple of millions, and last year it was about $22,000,000, or a little over 6 per cent. From December 1 to April 1 there has been an increase oftener than a decrease. And yet every autumn there is a monetary stringency which threatens business and has several times caused a panic or required special measures of relief from the Treasury.

Our subcommittee of the Senate Finance Committee has been trying to invent some process of reducing a circulation that should become excessive. An efficient system of redemption retires the currency very promptly, as the preceding table shows. The most radical advocates of an asset currency in this country only ask that the banks should be allowed to issue notes to 75 per cent. of their unimpaired capital; the Canadian banks may issue to 100 per cent., and at the end of last October the circulation exceeded 90 per cent. of the paid up capital, and was nearly 60 per cent. of the capital and surplus.

There is every reason to fear that autumnal monetary troubles will recur until Senators are willing to be guided by experience, even though some of the experiences may be foreign.

## Methods of Some French Tool Steel Makers.

Representatives of French manufacturers of tool steel have for some time been traveling through this country, working on a petty scheme apparently devised for the purpose of increasing present trade with no prospect of permanent business. Exceedingly plausible statements are made regarding the high character of the steel which they have for sale. The peculiar nature of the tool steel trade appears to offer special opportunities for the scheme which they have adopted. The claims which are made for the exceedingly high quality of the steel are of course by no means unusual in the tool steel trade. A feature of this trade is also the fact that, notwithstanding the traditional conservatism of steel users, a considerable percentage of them can always be found ready to listen to plausible representations and particularly if these representations are made with some degree of mystery or refer to the product of a foreign manufacturer. It is remarkable that many people are exceedingly credulous relative to statements as to the specially valuable qualities of the steel produced in the recesses of France or some other European country. They may be able to secure steel of as good a quality, and perhaps even better, from steel manufacturers in this country, but as "far away birds have fine feathers," they readily turn a listening ear to those who sing the praises of foreign steel and particularly of tool steel.

It appears that the producers of these French tool steels do not expect to sell any heavy tonnage, but are pleased if they can swell their sales to a moderate extent, and for this reason they have hit upon a scheme which must have worked to their advantage or they would not be following it up to the extent which has come to our notice. The method followed is to persuade a consumer to give them a trial order. He may order only a few bars of a certain size. When he receives the shipment he finds that instead of receiving only a few bars he gets a ton, or perhaps several tons. The steel is found to be fairly satisfactory, but perhaps no better than a good quality of American steel, and while the buyer is annoyed at the error in the shipment he usually pays for the entire quantity, after some correspondence and possibly an explanation that an error had been made in reading the quantity ordered. Sometimes, it may be stated, the quality of the steel is not up to the claim that had been made for it, but such arrangements have been made for the payment of the invoice that the buyer finds it expedient to settle the bill and charge the result up to experience.

It may profit some of our readers to learn the particulars of a recent incident which happened in connection with one of these transactions. An American consumer of steel had given a small trial order to a representative of one of these French steel concerns and had received the usual enlarged shipment, amounting to many times the quantity he had ordered. Not feeling inclined to submit to what he considered an imposition he refused to settle on the presentation of the bill and let

the matter rest for a time. Shortly after this he made a trip to Europe, and one day while in France it occurred to him that he was in the vicinity of the works from which the shipment of steel had been made. He concluded that he would call on the manufacturers and, on presenting his card, found himself a few minutes later in the custody of a gendarme, who took him before a local magistrate. Here a charge was made against him by the steel manufacturers and he was compelled to pay the full amount of their claim, or find himself subjected to a great deal of trouble. This experience should be borne in mind by those of our readers visiting France who may happen to have sustained similar relations with French steel manufacturers and against whom a disputed account may be held.

The manufacturers of steel in France, as elsewhere, whose product has acquired a justifiable reputation in the trade have usually established a connection with some American house, or they have their own branch house in this country. Against manufacturers of this class nothing can be said. Their products are sold on their merits and have an established footing, but the traveling representatives of a foreign house whose standing is not known should not be received with such great credulity as seems to prevail among a very large number of steel consumers. Careful inquiry should be made regarding them before trusting them with any orders, however small. It is a comparatively petty business, but it entails annoyances which may as well be avoided.

## The Guidance of Labor Unions.

So much has been written and so much more said about labor controversies with which the industrial world is plagued that it would seem the subject has been worn threadbare. But the problem still confronts us, and until a solution more or less satisfactory to the majority is reached, words will be found to express new theories, or, at least to clothe old ideas in a new dress. From one standpoint, however, the question before us is like a circle, endless; or like the riddle of the Sphinx, ever renewed or renewable, devouring intellects if not bodies. But while there have been and doubtless always will be periods of social unrest, changes of conditions or changes of environment will help to settle many of the vexatious problems now confronting us. We are too apt to forget or overlook the fact that humanity, as well as other things in nature, is subject to immutable laws which will prevail eventually. By wrong or right action, however, we may retard or accelerate a settlement.

It may be that because we are in the very heat of the distemper judgment is clouded and the remedy *par excellence* for our malady hard to find. It is significant, however, that conservative employers, as well as the more intelligent members of labor unions, have an abiding faith in the outcome of existing difficulties, and that the present is a time to exercise cool patience. On the other hand, there is a belief that times do arrive when patience ceases to be a virtue and wise men recognize that the present tendencies of labor unions unchecked would lead to changes little short of revolution. Labor unions are, indeed, in danger from the internal disintegrating forces which have been evoked by the introduction of large bodies of raw recruits laboring under the load of zeal of the neophyte. This element, in fact, may prove to be the metaphorical stone tossed among the warriors sprung from the dragon's teeth.

Current happenings among strikers are full of melodramatic incidents, and the Chicago district has been unusually prolific since May 1 in such developments, all of which have tended to make more glaring than ever the abuses which honeycomb many labor organizations. One of the latest outrages committed under the labor union banner is the strike of the engineers employed by the packers at the Union Stock Yards, Chicago. The "walk out" seems to have been wholly inexcusable. Here is a case where differences were submitted to arbitration, the award made and accepted by both parties to the controversy and then repudiated by the employees without the slightest warning of their intended action being given to the employers. The charge of anti-union discrimination against the packers seems to have been merely a pretext of the engineers within the shadow of which to hide from the consequences of their reprehensible action.

Again there is evidence that many other unions are endeavoring not only to fix the hours of work and rate of pay, but to designate who shall and who shall not work, and in what manner the work shall be executed—as in the case of the inside bridge workers. It would seem that if employers should accede to such arbitrary and audacious demands they would be left but little else than the privilege of supplying the funds to carry on the business usurped by the employees.

Such experiences are calculated to sour the milk of human kindness, and there can be small wonder that the Chicago Employers' Association have decided to eliminate sympathy and sentiment from their dealings with such employees. Possibly more stringent methods will be productive of better results. The decision not to grant annual vacations, not to care for and pay full wages to employees who are sick, but to be more stringent in imposing penalties for tardiness, is in line with the harsh but salutary treatment determined upon. While labor considered from one standpoint is a commodity, it is desirable that the "touch of nature which makes the whole world akin" should not be entirely eliminated from dealings between the employees and the employers, but the flower of sympathy cannot blossom in a soil made barren by rocks of contention.

Employers, as a rule, are not opposed to the organization of employees, but they still assert their right to employ either union or nonunion workers and insist upon the privilege of conducting their business on sound principles without interference.

Society to-day, as in the past, is founded rather upon self interest than upon altruism, and will continue upon this basis, at least, until human nature has been born anew. But an enlightened is better than a blind self interest, and while the benefits derived from organization are doubtless abused by some capitalists, as well as by some laborers, the latter are more liable to errors arising from an incapacity to understand the difficulties with which they must deal and are too often swayed by prejudices and passions.

It has been pointed out time and again that many of the errors into which labor unions fall are due to vicious leadership. Men of higher character, broader views, greater intelligence, of more liberal education and possessed of a quicker conscience, are required to guide the force born of organization. But too often even such men become the tools rather than the masters of organized labor. Too often the men who wield, or are wielded by, the union forces lack discrimination, being blind to the real interests of the employees. In making intelligent demands for higher wages or shorter hours it is necessary to be familiar with the general conditions of the industry, and to see the situation from the standpoint of the employer as well as from that of the employees. A leader should be possessed of some knowledge of the law

of sequences, and be able to determine somewhat of the future by a knowledge of the past.

It is absolutely necessary that kindly relations should be cultivated between the employer and the employees, and this state of mutual sympathy would redound to the benefit of all concerned. But better leadership can come only from the diffusion of intelligence through the mass and the raising of the average intelligence of the members of labor organizations. To this end it would seem that employers and the intelligent, conservative element of labor organizations should unite. How to do this is the problem of the hour.

## Electrolysis.

In a paper read before the American Electro-Chemical Society at a recent meeting A. A. Knudson called attention to a phenomenon of unusual interest and significance —the transference of electrical ground currents between cities or parts of cities separated by navigable rivers, by means of connecting metal bridges. While making an electrical survey of Manhattan in the spring of 1897 Mr. Knudson discovered that part of the current generated at the Kent avenue power station, in Brooklyn, passed over the New York and Brooklyn Bridge to the underground mains of Manhattan. In 1898 practically the same conditions were found, stray currents from Brooklyn flowing over the Brooklyn Bridge and passing down the columns of the Manhattan Elevated Railroad into the ground and to the gas and water pipes. These observations were verified in 1899 by the electrical engineer of the State Railway Commission. In 1902 it was further discovered that part of the power current generated at the Kent avenue station crosses the bridge, flows north and east by the agency of the gas and water mains, and makes its way back to the power house by the new Brooklyn Bridge. It also crosses the river at four definitely located points further north. Taking up the investigation on the Brooklyn side, it was found that currents which came out of the river followed the underground pipes back to the power station. One block from the river it was found that the difference in potential between the new bridge and the mains was 2 volts, the bridge being positive to the mains. At a distance of two blocks it was found to be 2½ volts, with the same direction of current. This would show that the material of the structure, as well as the pipes crossing by it, is a carrier of the current, and that the deterioration of the bridge by electrolysis is not only extremely probable, but, under favoring circumstances, inevitable.

This points to the conclusion that the new bridge is taking the greater part of the stray current sent out for surface car propulsion which formerly passed through the underground pipes of Manhattan to points further north, offering a path of less resistance back to the power house. It further means that where there is an accumulation of bridge sweepings or other material which, when wet, becomes a convenient electrode, serious corrosion is likely to be established, as has been shown to have occurred in the steel bridges of other cities.

The destruction of gas and water mains and underground iron work generally by electrolysis, due to the fact that currents are permitted to escape into the ground after serving the function for which they are generated, is too familiar and too well understood a phenomenon to call for consideration at this time. It has been exhaustively investigated, and the claims for damages which are piling up against the corporations which have created this dangerous nuisance may well give great anxiety to those interested in electric railway development. The commercial electrical engineer—the one who is able to make the best showing of immediate results at the least cost—has shrewdly reasoned that if his current goes astray, in whole or in part, no great harm will result to those employing him. The amperes, in obedience to a law of nature which is inflexible, cannot get lost, however much they try. Like the sheep in the nursery rhyme:

"Leave 'em alone, and they'll come home,
Bringing their tails behind 'em."

The tails in this instance may typify the volts. The sheep do come home, but minus their tails. The stray currents also come home, however far they may have wandered—somewhat spent, no doubt, as their energy has been partly consumed in doing work *en route* which not only did not need to be done, but which is highly mischievous. The original theory of the commercial electrical engineer who gave the matter any thought at all was that to restore the relaxed tension of these errant currents would cost less than to provide conductors for their return which would be sufficiently ample to offer them the path of least resistance in completing their circuits. So the earth was depended on as a conductor, in ignorance of or indifference to the fact that civilization has rendered communities dependent upon more or less continuous lines of subterranean iron pipes, and that these were "metal more attractive" to the currents in question.

This would have been without significance if the underground pipes had been good conductors, leading the current where it wanted to go. But they are not good conductors, and they lead the current into all kinds of blind alleys and dead ends, from which it must in one way or another get back to its normal path. In the case of cast iron pipes especially we have the conditions least favorable to the safe and comfortable conveyance of currents. A high resistance is interposed every 12 feet by the rope yarn and lead of the joint packing, and still more when cement is used. The result is that the current is continually going to and leaving the lines, and the mass of metal which is positive to another is the one which suffers from electrolytic decomposition. In other words, the currents in the ground do no harm to the masses of metal which attract them, but injure those which cannot hold them by reason of being relatively poor conductors.

This well established phenomenon adds an element of humor to the efforts of the commercial electrical engineers to convince the municipal authorities that they are at fault in the matter of electrolysis, in that they have enticed the currents away by providing alluring conductors for them to follow, and that the remedy lies with them, since if they will introduce sufficient resistance at frequent intervals, cutting the pipe lines into electrically disconnected sections, the currents in the ground will not seek them since they cannot follow them. This would not change the conditions in the least. A length of pipe would be as attractive if insulated at either end as if in metallic contact with another length. The higher the resistance interposed in a line the greater the certainty that the current will have to leave it when it becomes sufficiently charged to make it positive to some negative mass of conductive material which the current can reach. Then the harm begins. Electricity never hurts a good conductor. It is the poor conductor which it destroys, and, other things being equal, the conductor which the current leaves oftenest is the one which is soonest and most completely destroyed by it. An iron pipe line with high resistance interposed is the one which would soonest and most seriously suffer from electrolysis.

But it is the condition and not the theory which is interesting. The annual destruction of property by elec-

trolysis must be calculated in large figures. Important public improvements on which the health, comfort and prosperity of communities depend are being destroyed with a rapidity wholly unnecessary because avoidable. It is no doubt a convenience and economy for the corporations using electrical currents of large volume and high potential to turn them loose like cattle on the unfenced plains, knowing that they will ultimately round themselves up and come into the corral without herding; but this plan has disadvantages in settled districts, where the cattle in question devastate the gardens and demolish the fruit farms of the people who do not own them and have no direct concern in their economical fattening. This is exactly what the electrical railways are doing all over the United States. They may have sinned ignorantly against the public interest in the first instance, but this is no longer true. They are perfectly willing to let the future take care of itself and to postpone the day of reckoning as long as possible. But the accounting must come sooner or later, and when it does it will be found that their sins against light have involved them in liability for damages which in many instances far exceed the value of their tangible assets.

## The Organization of the Employer.

### The Local Association and Its Affiliation with the National Body.

#### Cincinnati a Good Example.

Ever since this country began to contribute to the industrial progress of the world and its people there has been a tendency toward co-operation or combination of manufacturers. These efforts have, however, been directed chiefly toward more economical and efficient methods of production and distribution. Throughout all, the manufacturer has to some extent either lost sight of or neglected the fact that he was an employer as well as a producer. In the meantime, the employee was awake to the possibilities of a combination along his own lines for his own purpose. The result is the present day labor union, or, rather, trade unionism.

It was not necessary to have one's ears so very close to the ground to hear a wide expression of willingness to "let sleeping dogs lie." Only when there were distinct evidences of sleeplessness on one side did "the other side" show signs of real wakefulness. Then the spirit of combination was frequently aroused and a banding together of employers in a community resulted. But these movements were usually temporary, as the cause for the activity being disposed of, the object had, for the time, been attained. Another reason was that the employers had not organized on a broad, unselfish basis, calculated to bring about lasting good for all concerned, but simply to meet an unanticipated exigency.

Recent developments in the labor situation have awakened widespread desire among manufacturers to anticipate movements rather than to hurriedly pull themselves together when problems for immediate action actually confronted them. Hence there has been considerable activity of late in the organization of employers' associations. The activity has been of sufficient duration to show that it is the organization that goes deeper than a mere alliance to flank union demands that is enabled to cope with the problem successfully.

This phase of co-operation among employers has its root in the local association. It is from the individual shop that the trouble spreads on and out over a branch of trade until covering an entire industry, if allowed; or when the sympathetic element enters, the course is from the individual establishment to the locality, city or town and so on. Therefore, it has been found that the thorough organization of employers of a city, town or community is the first requisite. As the labor unions organize along the lines of the different trades, so it has been found advisable for employers to organize. Thus, locals of the trades of a city when combined or affiliated as a local federation of employers are not only in a position to interchange ideas while controlling the situation, each in its particular trade, but are always ready to stand together when occasion demands it. A well organized city or town is therefore organized along two lines, one making locals of the employers in the various trades of the community and the other on corporate lines. In the first the employers of the separate trades meet and exchange ideas, compare conditions and work together for the amelioration of conditions in the particular branch of trade in which they are interested. As they are dealing with the same classes of employees, much can be accomplished along this line. Under the second division all meet as manufacturers or merchants, or, still better, on a common plane as employers. This body is the local federation of employers, ready for joint action to avert or handle sympathetic strikes, bring about municipal improvements, correct municipal evils and work for the general good of the city or town.

The next step in the scheme of the labor union is the Central Federation or State body. The tendency of employers' organizations is in the same direction, as a centralization of the local federations according to States is desirable, particularly so far as the building trades are concerned.

The labor unions all have their national bodies, and these in turn are brought under the single head of the American Federation of Labor. There are now national organizations of employers covering the various trades, as, for illustration, the National Metal Trades Association. The benefits of the national association of any trade have been proven by those now in existence. Briefly stated, the national association is the fountain head of information for the locals. Its function is largely educational, imparting to one locality information and ideas gleaned from another. In a similar manner it can approximate at least a uniformity in the supply of labor, advising the sections of the country where help is scarce of an abundance which may exist in another locality, and in fact acting as a clearing house for the locals.

Finally, the trend of development is toward a national federation of employers to parallel the American Federation of Labor. This, it is suggested, will probably be composed of representatives of the national trades associations or State federations. Its function will be to attend to legislative matters and present the employers' side of the case in connection with such matters as may receive the attention of the American Federation of Labor.

While local associations have sprung up in great numbers in all sections of the country within the last few months, there is a city which has fostered employers' alliances of various sorts for upward of three years—long enough to have tested their scheme, and not only to have found it sound but to have actually discovered that the manufacturers of a community can do more and better business through co-operation in the broad and true sense of the word than in the way they used to do it. Incidentally, the spirit manifested in their business methods also extends to their employees, who are contented as a whole, and feel that even though their employers are banded together in strong associations their interests are bettered rather than hampered thereby.

#### Cincinnati

is the city referred to, and conditions existing in the "Queen City" at present are particularly interesting, in view of her importance as a center for production of machinery. Here manufacturers in various lines of trade meet not only for business, but also for social intercourse, breaking down the barrier erected by business competition, co-operating wherever possible in matters of common interest. There are a number of local trade associations in this city, including principally the Brewers' Exchange, Cigar Manufacturers' Association, Shoe Manufacturers' Association, the Carriage Makers' Club, the Furniture Exchange, the Building Contractors' Association, which is composed of 18 organizations confined to various crafts in the building line, and finally the

#### Cincinnati Metal Trades Association.

This association was formed three years ago by members of the National Metal Trades Association. Ever

since these two organizations have worked in closest harmony and they have largely been responsible for the friendly feeling existing between the local members. The organization was fortunate in having been started a year before the strike of 1901, and when May 20 of that year came Cincinnati employers were ready for the emergency. The result was a clean victory for them. They met on a common ground, holding that they were all employers of the same class of labor and confronted with the same conditions. The friendships made in the association prior to the strike were cemented during the struggle, and to-day they are so strong that the beneficial influences have extended far beyond the original purposes of the organization. Similarly has the influence of the association been widened. The social features always were of an excellent order. Frequent meeting to discuss common troubles were held. A quarterly dinner produced a change, which added a charm to the meetings and which, accompanied by after dinner talks by interesting and entertaining speakers, made the occasion both memorable and beneficial. This, together with other dinners and less formal functions, served to instill a feeling of good fellowship such as probably nothing else would have done. Bitter feelings between competitors were removed, and they now work together in thorough harmony for the good and welfare of not only themselves, but the whole community, promoting and extending their influence beyond their own craft and uniting their cause on a common ground with other organizations which have similar purposes in different branches of trade.

As an illustration of the genuineness of the co-operation among the machinery builders of Cincinnati, an instance might be mentioned which occurred during the writers' visit to that city. Two Canadian purchasers were in the city with a view of looking up the products of the manufacturers. Their time was limited, especially when the necessity of visiting all of the manufacturers they desired to see was to be considered. Instead of being visited the manufacturers called in a body at the hotel at which the gentlemen were stopping, and over the dinner table heard the story of their guests. It was then an easy matter to arrange a meeting, which was held the next day at one of the prominent machine tool builders' offices. The various manufacturers knew what they would be called to talk about and came prepared. There were no jealousies among the sellers, all shared the expense of the dinner, each made his play for his portion of the business, and it is safe to say that as the city can boast of a good variety of machine tools among her products, the orders were left in Cincinnati.

This illustrates but one phase of the co-operation of Cincinnati machinery builders.

### The Objects

of the Cincinnati Metal Trades' Association, as stated in their constitution, are, first, to secure a closer social relation between members; second, for the discussion and the consideration of and co-operation in any questions affecting their interests. These objects being extremely broad, cover many features. The greatest good accomplished is in the restoration of peace and harmony among members and their employees after having engaged in a long and a severe struggle. It is an actual fact that this harmony prevails not only among employers, but between employer and employee as well. That all are working together for common good is evidenced by a recent transaction whereby the men were voluntarily granted a reduction in hours without loss of pay. To be more specific as to this, on April 25, after the Executive Committee of the Cincinnati Metal Trades Association had carefully considered the labor situation, that committee, without any demands or requests from the employees, recommended a reduction of the working time in the shops from 57 to 55 hours per week with no reduction in pay. The association voted its adoption unanimously. The good feelings on the part of the employees are shown by the fact that in nearly all of the shops votes of thanks signed by the employees were immediately presented to the employers. A copy of one of the resolutions, which was tendered the Cincinnati Milling Machine Company, is as follows:

"*Whereas*, The Metal Trades Association of Cincinnati, at a meeting Saturday, April 25, reduced the working hours from 57 to 55, with no reduction in pay, and this was done voluntarily; therefore it is

"*Resolved*, That we, the undersigned, employees of the Cincinnati Milling Machine Company, tender our thanks and appreciation of same to our employers, and hope that the good feeling between the employers and employees will continue."

The opinion finds expression among Cincinnati manufacturers that an industry such as has its seat in that city can only thrive properly when unharassed by ill will between employers and employees. The association has its own

### Offices and Meeting Room

in a central location, comfortably but not expensively furnished, and maintained in a building into which no workman need feel any delicacy in entering if in search of employment or information from the secretary. The members meet here from time to time as a whole or by groups to discuss the various phases of their business. This is, of course, in addition to the regular association meetings. A regular monthly meeting of the association, which is held at headquarters, includes not only the members, but their superintendents and foremen who are entrusted with the handling of employees and supervision of the work. Papers are read and discussed relating to technical and labor questions. The effect of these meetings is to have superintendents and foremen thoroughly understand the object of the association and the methods used to carry out these objects.

Through the foremen many misapprehensions have been removed from the minds of many of the workmen, who believed that the organization of employers was for the sole purpose of crushing the laboring man. These meetings have created a friendly feeling and demonstrated to the foremen that they were not, as many had supposed, between the millstones of the employers' association on one side and the union on the other. The discussion of papers relating to shop practice has had a magnificent influence on the methods of production in the shops. The members are extremely free with information among themselves. New methods are presented in the form of papers and discussed, and of course the shops are open to all for more thorough inspection of such methods when desired. As an illustration of the last two papers which were discussed, we might mention the fact that Wm. E. Lodge presented a carefully tabulated paper on his experience in the use of the new high speed tool steels, and the general effect which their adoption is having upon the designing of machine tools as well as the production of shops employing them. Another very interesting paper was read by Frederick Holz of the Cincinnati Milling Machine Company, and reviewed interesting jobs of milling which have been done at the company's shops and have come to their attention in other shops. This paper was elaborately illustrated by blue prints and models, showing where milling operations could be employed to advantage over methods commonly used.

These meetings are free from formality. The employers mingle with their foremen, cigars are passed around, and the refreshments generally consist of sandwiches and beer.

This particular *menu* is selected with a view of accelerating the elimination of all stiffness, and the attendance of the meetings is now on a basis where they thoroughly understand one another and get right down to work.

### The Secretary's Work.

The every day work of the association through its secretary is perhaps the most interesting. Mr. Fisher, the secretary, gives his full time to the work of the association. He keeps in touch with all the members, diagnoses their needs and helps straighten out many of the little misunderstandings that arise between employees and their foremen or superintendents. In this connection he acts as a sort of "social secretary" for all of the members. He is in a way the personal representative of each employer, and while having no authority over the foremen or superintendents, furnishes an independent channel through which complaints can come from the workmen without passing through their immediate supe-

riors. By using tact and befriending the workmen, although at the same time maintaining his impartiality toward all parties concerned, many difficulties which might become serious if allowed to continue have been straightened out to the satisfaction of the men and their employers, and many abuses unsuspected by the heads of the firms have been quietly corrected. This feature of the work has made the members of the Metal Trades Association of Cincinnati better employers, their superintendents and foremen better handlers of men, and has actually been a means of convincing many men that their employers were really willing to deal even liberally with them, thus bringing the employer and employee nearer a common understanding. As an instance of what trouble may arise from trivial affairs and how such trouble is averted by the secretary of the local association, a case recently came to the attention of the secretary where the men thought they had a grievance, the employers thought that their time was being misused, and this diversity of opinion caused a strike. In the particular shop referred to the men were in the habit of nibbling at a sandwich or light luncheon in the middle of the forenoon while at their work. The practice soon grew to such an extent that the men congregated in groups at about ten o'clock and made a regular luncheon period of this hour, dropping their work entirely. The foreman in charge of the shop, to break up this practice, posted a notice that in future no lunches would be allowed. The men held a meeting that evening and seemingly decided to try him out. The next morning, in defiance of the notice, some of the men marched up and down the shop ostentatiously chewing away at the sandwiches and making remarks to the other employees, such as "work, you slaves, work, you can't eat here." These men were discharged, and 35 others immediately dropped their work and went on strike. The machinery builders brought the matter to the attention of the local Metal Trades Association, and the secretary called a meeting of the men, explained to them their error in a friendly way, showing them the disastrous effect of the practice which they had inaugurated and their foolishness in abusing the original privileges accorded by their employers.

The men realized their mistake and inside of 24 hours the strike was over. The employers were also given a little advice by the local secretary, and as a result the objectionable sign was taken down and friendly relations restored, the bad practice at the same time being eliminated.

Through the secretary of the association the true feelings of the workmen are reached. The foremen are sometimes found to use harsh words, and they are shown that diplomacy and a little kindness can be used in correcting the men who properly resent mistreatment and thus some men whom the foremen are inclined to think undesirable are shown to be very good workmen.

### The Employment Department.

This feature of the work is found to be one of the most efficient and useful sections of the entire programme. The benefits which have already been derived by Cincinnati manufacturers lead many to state that this work alone is worth the entire outlay which the association entails. The operation of this department was fully described in *The Iron Age* of April 9, 1903, in the paper read by James C. Hobart of the Triumph Electric & Ice Machine Company of Cincinnati, at the Buffalo meeting of the National Metal Trades Association. So as to fully explain to the employees the objects of the employment department a circular bearing on its face an illustration of two clasped hands, representing the employer and the employee, was distributed broadcast among the workmen of Cincinnati. The text of the circular is as follows:

The Employment Bureau aims to establish the principle of fair dealing between employee and employer, and to protect both in the exercise of their free rights as individuals, given by the Constitution of the United States.

The Bureau will not stand for any unfair dealings on the part of either employers or employees.

The main purpose of the bureau is to make it easy for the employer to find men who want work, and for the men, when they want work, to find an employer. A plain, simple proposition, making it possible for men out of work to learn at one place which employers are in need of men, and by leaving their applications, make it possible for employers to learn at one place what men want work.

It saves time and it saves car fare. The employer gives first attention to the men sent from the office of the bureau.

In addition the bureau will—

1. Listen to any complaint of any workman regarding unjust or unfair conditions, and if, upon investigation, such complaint is well founded, will correct such condition without divulging the name of the employee making the complaint.

2. If a workman desires, for any reason, to move to another part of the country, it will not only direct him to where men are needed, but give him such a letter as will secure him employment.

3. The bureau will assist any man desiring to better his condition, and our secretary will at any time furnish a list of employers desiring men of the applicants' particular class of ability.

The Bureau has found employment for nearly 500 men since January 1.

It has listened to complaints of individual workmen and corrected abuses which were unsuspected by the employers.

It has advised and induced many apprentices to complete their contracts.

All of this is to the advantage of the employee, and with your help, which the bureau earnestly desires, much more can be done.

The operation of the Bureau is no secret, but is open to all. Our secretary will welcome you and give you as much of his time as you desire.

One of the principal objects of the Bureau is to show both employer and employee that their interests are identical, and that the greatest good can be secured for both by their united efforts.

The bureau keeps no black list.

THE CINCINNATI METAL TRADES ASSOCIATION,
148 East Fourth street.

Briefly stated the workings of the department are as follows: The names of all men at work in their shops together with information regarding their character and ability are properly filed at the office of the association. The employers advise the association of all men taken on as fast as they are put to work, and also of all men leaving their employ. When they want men they advise the secretary, who thus has a list of the unemployed at his disposal, and is able to pick out the men most likely suited to the work to be done. At the offices of several of the members of the association notices are posted to the effect that applications for positions should be made to the secretary of the employment bureau. This saves the employer considerable undesired annoyance at times when he is not looking for men. At the same time it furnishes the association with the applicant's name, his record is investigated, and even though he may not find immediate employment, if he is the sort of man desired by any of the members at any future time it is possible to enter into negotiations with him. Whenever a good man is out of employment and another member desires such a man he is immediately notified and sent after the vacancy. Misrepresentations on the part of men are absolutely futile, and the men soon learn that it behooves them to be truthful. The department aims to have employees satisfied with their positions, and aims to remove the causes of dissatisfaction, or, in other words, aims to place a man where be will be satisfied. The effect is to stop a great deal of shifting and restlessness which existed before the establishment of the department and, of course, to enable the employer to know his men better than he could otherwise. Great care is taken that no harm is done whatever either to the employee or the employer. Whenever an employee is discharged under unfavorable circumstances—that is, when a dispute has arisen which the employer cannot consistently take a hand in personally, the secretary of the department attempts to adjust the matter, and if successful the man may either be re-employed by the concern or the facts properly stated to another employer who may be in need of help. In practice this often shows that the workmen are willing to deal with an arbitrator, promising to do better and in some cases surprising the employer by their humility after having the case presented them in a kindly way by some one other than the person whom they think directly responsible for their trouble. It will be seen, therefore, that a generous and lenient policy, coupled with firmness and justice, has proved the desirable course, but, of course, a great deal depends upon the selection of the secretary of the bureau.

In times of strikes or the threatening of such events this organization is invaluable. It enables the employers

to present a united front to every danger and to protect each other thoroughly. Should there be a strike in Cincinnati in one of the Metal Trades' Association shops that shop is the only one opened, all the other immediately ceasing to employ new men until the trouble is over; in fact, men are sent from other shops if necessary to start things going in the afflicted shop. The strike of 1901 was finally broken in the last shop by foremen and superintendents from other shops.

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While the national and local organizations tend to the same end—namely, to secure and preserve equitable conditions in the workshops of the members, whereby the interests of both employer and employee shall be properly protected, in their character they are looked upon as positively different, each having its particular field of interest.

The national office gathers, from all over the country, information regarding labor conditions and the different phases of the labor questions as they occur in the various localities. With this information at hand and making use of the experience in meeting these conditions, as gained from all over the country, this information is in turn condensed and in a systematic manner transmitted to the membership as required.

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As the name indicates, this is an alliance of all the employers' associations in the city. It is composed of delegates appointed by the various organizations, the object being to co-operate in matters of common interest and to place the experience of each of the associations at the disposal of all. Cincinnati manufacturers believe that their employers' federation will prevent the possibility of any general boycott such as existed in Waterbury. The opinion finds expression that the federation is powerful enough to break any sympathetic movement on the part of the unions, and that in fact its very existence is a safeguard against any contemplation of such a move on the part of the unions.

## The Labor Situation in New York City.

Strikes have hampered many lines of activity in New York and the surrounding territory during the last week. The greatest disturbances were caused in the building trades and on the Rapid Transit Tunnel. The tie up of the building trades assumed such proportions as to move the employers to united action.

The directors of the Building Trades Association sent out a call Tuesday for a big meeting of employers to be held on Friday evening. The declared object of the meeting is to devise some remedy for the strike conditions. A complete organization of the employers in the building trades to resist demands of the unions is expected to be the result of the meeting.

About 3000 invitations to the meeting on Friday evening were sent out. The invitation was signed by Warren A. Conover, president, and William K. Fertig, secretary and treasurer of the association, and was as follows:

"The time has arrived when employers of labor in the building trades are facing a serious situation, and a meeting will be held on Friday, May 15, at 8 p.m., at the Building Trades Association, 1123 Broadway, for the purpose of determining what steps shall be taken to remedy the existing intolerable conditions. You are earnestly requested to be present."

Charles L. Eidlitz and Leonard K. Prince, first and second vice-presidents of the association, attended the meeting of the directory Tuesday, when the decision was made to call the meeting. Other directors of the association are Stephen M. Wright, Ronald Taylor, Alphonso E. Pelham, Frank Kessing, George S. Holmes, James Curran, Vincent C. King, John Little, Francis E. Howland, Hugh Getty, F. B. Tuttle, Henry W. Miller and William T. Ritch. They all agreed that the tie up of building operations in the city would be complete in a few days if the strike continued. It was high time, they said, that the employers in the building trades had a compact organization to deal with the demands of the unions of employees.

The men who were responsible for calling the meeting said that they could not tell what the plans of the meeting would be, but one of the first steps in the way of coping with the strike situation would be the formation of a powerful organization of the employers.

Employers in Brooklyn last Monday night organized the Brooklyn Employers' Association to cope with the situation in their borough.

The striking members of the Inside Architectural Iron Workers' Union, whose demands for a new wage scale and other conditions have been refused by the Iron League, have reported yesterday that 400 of their number employed by 15 firms have gained their demands and returned to work Tuesday morning. None of the 15 firms belongs to the Iron League.

The Iron League held a meeting in the Fifth Avenue Hotel Tuesday. It was estimated that through the strike and lockout about 6000 men were out. The secretary of the league, C. M. Cheney, gave out the following statement after the meeting:

"The Iron League and a committee from the Architectural Iron Manufacturers' Association and the Wire Manufacturers' Association met in the Fifth Avenue Hotel this afternoon. A strike committee was formed and resolutions were passed for a unanimous resistance to the strike of the Inside Architectural Iron Workers which is now on."

J. M. Cornell presided at the meeting, and among the firms represented were the following: Milliken Brothers, Hecla Iron Works, Lewinson & Just, Richie, Brown & Donald, Cooper Wiegand Company and Garrigues & Co.

The machinists employed at the marine shops in New York City and vicinity have presented demands to go into effect June 1. They ask for a minimum wage of $3 per day and for all now getting less than that rate. For all machinists now receiving $3 a day or more an advance of 5 per cent. is demanded. The New York Metal Trades Association, which includes the employers affected by these demands, will hold a meeting Thursday, May 14, to consider the matter. The result of this meeting will doubtless be the appointment of a committee to confer with the union representatives and take the matter in hand. It is generally believed that the demand of the machinists is the result of the agreement which was made with the boilermakers last week and which was printed in the last issue of *The Iron Age*. Other shops than the marine shops have not been notified of the desired increase as yet. The result of the present move will doubtless determine the course to be taken by the union regarding other shops.

In answer to the men's refusal to return to work pending arbitration Contractor J. B. McDonald of the Rapid Transit Tunnel issued an ultimatum requiring all men to return to work Wednesday noon and remain at work pending arbitration. The men on strike are chiefly Italian laborers. The president of the general organization controlling them advised them to return as demanded by Contractor McDonald. At noon some of the men did return, but five local branches of the union, representing about 7100 men, refused. At this writing the situation is very dubious.

Considerable disturbance has been caused in Newark, N. J., by striking molders' helpers. The laborers have been on strike for about a week, and in certain instances have resorted to violence. Practically all of the foundries in the city are affected.

## Iron and Industrial Stocks.

Somewhat ridiculous reports about a break in the steel market were made the pretext for an attack on the steel shares on Tuesday, and the market yielded somewhat. On the whole, the market has been quiet with a declining tendency.

One of the interesting incidents in the stock market of the past week was the erratic course of the bonds of the United States Shipbuilding Company, the corporation owning a large number of coast shipbuilding plants, together with the Bethlehem Steel Company. For a considerable time no transactions had occurred in these bonds, the last reported sale having been at 44, during the tight money market early in April. On May 7 41 was bid and 71 offered on the Stock Exchange, and they were gradually offered down to 55. Sales were then made at 55 and at 49. While this occurred on the Stock Exchange, sales were being made in the curb or outside securities market at 44½ and 45. It was reported that the low prices were caused by forced sales of some holder. Reports of a reorganization are current and some statements of the same, which, however, are not official, have been printed.

It is probable that the directors of the Westinghouse Electric & Mfg. Company of Pittsburgh will declare an extra dividend of 4 per cent. this week, or else will increase the regular dividend.

**Dividends.**—Niles-Bement-Pond Company have declared the regular quarterly dividend of 1½ per cent. on the preferred stock, payable May 15.

Pratt & Whitney Company have declared the regular quarterly dividend of 1½ per cent. on the preferred stock, payable May 15.

Virgil C. Gilman, one of the most prominent citizens of Nashua, N. H., and at one time Mayor of the city, died on the 28th ult. after an illness of about three weeks. Mr. Gilman was born in Unity, N. H., May 5, 1827. He was president of the Nashua Saddlery Hardware Company and the Peterboro Railroad, and a director in the Underhill Edge Tool Company, the Amoskeag Axe Company, Indian Head National Bank and Nashua Iron & Steel Company.

# An Enormous Pig Iron Production

## Stocks Practically Stationary.

In spite of the fact that quite a number of furnaces, in some cases weakened by the frequent banking during the coke troubles, have been blown out, the resumption of others, the starting of two large new furnaces and the heavy output due to the free supply of coke, have made the product of April the record month. Although it was a month of only 30 days, the output came close to a total of 1,650,000 tons, or at the rate of 19,750,000 tons per annum.

The extraordinary fact, however, is that the stocks in the hands of merchant furnaces remained practically stationary, a clear proof how enormous is the current consumption.

The weekly capacity of the furnaces in blast on May 1 compares as follows with that of the preceding periods:

| | Total capacity per week. Gross tons. | Coke capacity per week. | Charcoal capacity per week |
|---|---|---|---|
| May 1, 1903 | 383,897 | 375,696 | 8,201 |
| April 1 | 376,576 | 368,215 | 8,361 |
| March 1 | 354,733 | 347,424 | 7,309 |
| February 1 | 343,111 | 335,339 | 7,772 |
| January 1 | 353,800 | 346,073 | 7,727 |
| December 1, 1902 | 343,817 | 336,617 | 7,200 |
| November 1 | 337,559 | 330,110 | 7,449 |
| October 1 | 345,048 | 337,837 | 7,211 |
| September 1 | 335,189 | 328,243 | 6,946 |
| August 1 | 336,465 | 328,745 | 7,720 |
| July 1 | 350,890 | 343,250 | 7,640 |
| June 1 | 344,748 | 337,492 | 7,256 |
| May 1 | 352,064 | 337,627 | 6,437 |
| April 1 | 337,424 | 331,140 | 6,284 |
| March 1 | 323,028 | 316,039 | 6,989 |
| February 1 | 332,045 | 325,440 | 6,605 |
| January 1 | 298,460 | 291,992 | 6,468 |
| December 1, 1901 | 324,761 | 317,358 | 7,403 |
| November 1 | 320,824 | 313,775 | 7,049 |
| October 1 | 307,982 | 300,538 | 7,444 |
| September 1 | 299,861 | 293,256 | 6,605 |
| August 1 | 303,847 | 297,269 | 6,578 |
| July 1 | 310,950 | 303,793 | 7,157 |
| June 1 | 314,505 | 306,391 | 7,514 |
| May 1 | 301,125 | 293,915 | 7,210 |
| April 1 | 296,676 | 288,766 | 7,910 |
| March 1 | 292,899 | 284,825 | 8,074 |
| February 1 | 278,258 | 269,923 | 8,335 |
| January 1 | 250,351 | 243,254 | 7,097 |
| December 1, 1900 | 228,846 | 222,067 | 6,779 |
| November 1 | 215,304 | 207,381 | 7,923 |

From official returns covering over 99 per cent. of the tonnage we estimate the production, month for month, by districts as follows:

*Monthly Pig Iron Production.*

| | December, 1902. | January, 1903. (31 days) | February, 1903. (28 days) | March, 1903. (31 days) | April, 1903. (30 days) |
|---|---|---|---|---|---|
| New York | 34,829 | 33,071 | 35,360 | 43,941 | 42,069 |
| New Jersey | 17,432 | 17,378 | 12,791 | 14,834 | 19,998 |
| Schuylkill | 46,527 | 49,007 | 41,349 | 48,476 | 45,234 |
| Lehigh | 53,853 | 58,687 | 57,638 | 60,804 | 61,286 |
| Susq. and Lebanon | 39,945 | 41,147 | 35,720 | 46,052 | 53,782 |
| Pittsburgh | 368,851 | 360,795 | 328,799 | 372,125 | 362,747 |
| Shenango | 110,363 | 111,098 | 111,725 | 117,533 | 127,985 |
| West Penn | 89,767 | 93,777 | 86,037 | 105,488 | 97,294 |
| Md., Va. and Ky. | 85,357 | 79,390 | 83,550 | 92,798 | 93,039 |
| Wheeling | 71,990 | 53,907 | 56,189 | 64,044 | 69,743 |
| Cent. and No. Ohio | 106,032 | 90,757 | 90,575 | 108,587 | 110,017 |
| Mahoning V. | 124,658 | 107,510 | 112,678 | 137,744 | 129,988 |
| Hanging Rock and Hocking Valley | 31,289 | 26,707 | 30,123 | 37,256 | 36,929 |
| Ill., Wis., Minn., Mo. and Col. | 170,708 | 170,880 | 147,179 | 170,971 | 199,685 |
| Alabama | 142,281 | 136,907 | 120,479 | 126,068 | 117,372 |
| Tennessee, No. Carolina and Georgia | 43,363 | 41,768 | 40,383 | 43,743 | 41,263 |
| | 1,537,245 | 1,472,788 | 1,390,615 | 1,590,470 | 1,608,431 |
| Charcoal pig. | 33,679 | 34,348 | 28,742 | 35,728 | 37,611 |
| Totals | 1,570,924 | 1,507,136 | 1,419,357 | 1,626,208 | 1,646,042 |

During March the capacity was increased by the blowing in of one Hokendauqua in the Lehigh Valley, No. 5 Carrie and one new Clairton in the Pittsburgh district, Ella and North Side in the Shenango Valley, one Pennsylvania Steel in the Lower Susquehanna, one Grand River and one Watts in Kentucky, the new La Belle in the Wheeling district, River in Ohio, one South Chicago in Illinois, and Philadelphia and one Woodward in Alabama. There were blown out one Crane and one Saucon in the Lehigh Valley, one Duquesne and one Edgar Thomson in the Pittsburgh district, one Cambria and Emporium in Western Pennsylvania, Buena Vista and Dora in Virginia, Furnace A of the National Tube Company in the Wheeling district, No. 1 Ohio Steel and Hannah in Ohio, one Pioneer and one Ensley in Alabama and Johnson City, and Standard in Tennessee.

*Coke and Anthracite Furnaces in Blast.*

| Location of furnaces. | May 1. Number of stacks. | May 1. Number in blast. | May 1. Capacity per week. | April 1. Number in blast. | April 1. Capacity per week. |
|---|---|---|---|---|---|
| New York | 17 | 10 | 9,816 | 10 | 9,922 |
| New Jersey | 7 | 5 | 4,207 | 5 | 2,878 |
| Spiegel | 3 | 3 | 459 | 3 | 471 |
| Pennsylvania: | | | | | |
| Lehigh Valley | 27 | 24 | 13,843 | 25 | 14,275 |
| Spiegel | 1 | 1 | 114 | 1 | 112 |
| Schuylkill Valley | 13 | 13 | 10,554 | 13 | 11,262 |
| Low. Susquehanna | 10 | 8 | 7,336 | 7 | 6,064 |
| Lebanon Valley | 12 | 6 | 5,213 | 6 | 4,970 |
| Pittsburgh District | 35 | 33 | 83,215 | 32 | 85,416 |
| Spiegel | 3 | 3 | 2,158 | 3 | 2,080 |
| Shenango Valley | 19 | 19 | 30,099 | 17 | 26,900 |
| West. Pennsylvania | 18 | 16 | 22,422 | 18 | 23,819 |
| Maryland | 5 | 4 | 7,144 | 3 | 6,232 |
| Wheeling District | 12 | 9 | 17,734 | 9 | 14,970 |
| Ohio: | | | | | |
| Mahoning Valley | 15 | 13 | 27,365 | 15 | 31,600 |
| Cent. and North | 14 | 13 | 26,150 | 12 | 23,550 |
| Hocking Valley | 3 | 2 | 933 | 2 | 971 |
| Hanging Rock | 12 | 10 | 7,683 | 10 | 7,271 |
| Illinois | 19 | 17 | 33,229 | 16 | 29,580 |
| Spiegel | 1 | 1 | 958 | 1 | 971 |
| Minnesota | 1 | 1 | 827 | 1 | 1,100 |
| Wisconsin | 5 | 5 | 5,259 | 5 | 3,520 |
| Missouri | 1 | 1 | 787 | 1 | 776 |
| Colorado | 4 | 4 | 5,125 | 4 | 5,000 |
| Spiegel | 1 | 1 | 407 | 0 | 0 |
| The South: | | | | | |
| Virginia | 23 | 18 | 12,404 | 20 | 12,900 |
| Kentucky | 8 | 7 | 2,364 | 5 | 2,175 |
| Alabama | 41 | 30 | 28,235 | 31 | 28,553 |
| Tennessee | 16 | 14 | 8,749 | 16 | 9,087 |
| Georgia | 1 | 1 | 600 | 1 | 600 |
| North Carolina | 1 | 1 | 307 | 1 | 290 |
| Totals | 348 | 293 | 375,696 | 292 | 367,315 |

While the actual production of coke and anthracite pig was at the rate of 359,135 tons in March, it rose to 375,298 tons per week in April.

*Charcoal Furnaces in Blast.*

| Location of furnaces. | May 1. Number of stacks. | May 1. Number in blast. | May 1. Capacity per week. | April 1. Number in blast. | April 1. Capacity per week. |
|---|---|---|---|---|---|
| New England | 7 | 2 | 165 | 1 | 97 |
| New York | 3 | 1 | 65 | 2 | 846 |
| Pennsylvania | 5 | 1 | 53 | 1 | 70 |
| Maryland | 1 | 0 | 0 | 0 | 0 |
| Virginia | 3 | 0 | 0 | 0 | 0 |
| Ohio | 8 | 0 | 0 | 0 | 0 |
| Kentucky | 3 | 0 | 0 | 0 | 0 |
| Tennessee | 1 | 1 | 62 | 1 | 62 |
| Georgia | 4 | 3 | 850 | 2 | 575 |
| Alabama | 5 | 3 | 1,013 | 4 | 1,233 |
| Michigan, Missouri and Wisconsin | 14 | 13 | 5,720 | 11 | 5,378 |
| Texas | 4 | 1 | 273 | 1 | 100 |
| Washington | 1 | 0 | 0 | 0 | 0 |
| Totals | 58 | 25 | 8,201 | 23 | 8,361 |

During April there were blown in Richmond in Massachusetts, Greenwood in Pennsylvania, Marquette and Wayne in Michigan, Rock Run in Alabama, and Cherokee in Georgia. There were blown out Buffalo in New York and Glen Iron in Pennsylvania.

### Stocks.

The position of furnace stocks, sold and unsold, as reported to us, was as below on May 1, as compared with the preceding months, the same furnaces being represented as in former months. This does not include the holdings of the steel works producing their own iron:

| Stocks. | Dec. 1. | Jan. 1. | Feb. 1. | Mar. 1. | April 1. | May 1. |
|---|---|---|---|---|---|---|
| Anthracite and Coke | 85,606 | 92,560 | 106,297 | 144,394 | 156,732 | 147,312 |
| Charcoal | 8,689 | 7,335 | 13,344 | 14,959 | 14,025 | 15,430 |
| Totals | 94,295 | 99,895 | 119,641 | 159,353 | 170,757 | 162,742 |

# MANUFACTURING.

### Iron and Steel.

Dispatches from Duluth, Minn., state that D. Marc, representing the French Metal Company of Paris, is in that city on his way to the iron ranges, where he will inspect properties with the view of leasing them for the company. It is understood that the French company intend establishing works in the vicinity of Pittsburgh for the manufacture of special tool steel.

The Lake Shore Wire Company, Cleveland, Ohio, recently incorporated, expect to place their plant in operation about August 1. They are in the market for a second-hand rod mill.

A decree entered in the Superior Court, Indianapolis, ends the litigation between the Central Steel Company and the Indiana Steel Company, growing out of the failure of the Premier Steel Company several years ago. The Indiana company held a 20-year lease on the beam mill on the Premier company's grounds, which the new owners of the property, the Central company, sought to have set aside. The decree provides for the payment to the Indiana company of $6000 and the winding up of the latter's affairs.

The Saxton Iron & Steel Company are rebuilding the old Valley Iron Works at Rock Run, near Coatesville, Pa. Much of the machinery for the new plant has been placed and one of the large engines was tested last week, but little has been done toward erecting the furnaces. It is expected that the company will not be able to operate before next fall.

The Pennsylvania Steel Company are erecting at Steelton, Pa., a 150-foot stack to a boiler house that is being built to supply the electrical power house with steam. This week was the busiest of the year at Steelton, the rail mill breaking all records for production in the history of the mills.

The Worcester works of the American Steel & Wire Company, the New Haven works of the National Steel & Wire Company and Roebling & Co. are turning out large quantities of armor wire for the cable which the United States Government will lay connecting Seattle, Wash., and Sitka, Alaska.

E. G. Rankin, J. W. Baillie and Mr. Brady of Pittsburgh; D. E. Mitchell, president of Cumberland University, Lebanon, Pa., and several capitalists have purchased 72,000 acres of rich iron fields in Wayne County, Tenn., and will spend $5,000,000 in developing the property. A company will be organized to operate the property, and will within a few weeks be ready to announce their plans, which will include the building of blast furnaces, rolling mills and other plants for finished product. Some of those interested in the project are connected with the Wheeling Steel & Iron Company of Wheeling, W. Va.

The McKeesport Tin Plate Company, Frick Building, Pittsburgh, whose works are at Port Vue, near McKeesport, Pa., are operating their plant to full capacity in all departments.

The property of the Continental Iron Company, at Wheatland, Pa., will be offered at Trustee's sale on Tuesday, June 9. The property was recently appraised as being worth $54,410.

### General Machinery.

The R. F. Wentz Engineering Company, Nazareth, Pa., have incorporated. It is not their intention to build a plant, but will have their product made by contract.

A contract has just been given by the American & British Mfg. Company of Bridgeport, Conn., to the Fore River Ship & Engine Company for nickel steel forgings for 32 3-inch field pieces, to be delivered at the rate of four a month after the first delivery.

For some time there have been rumors of changes in the Pusey & Jones Company, Wilmington, Del., and reorganization tion of the company became a fact May 9, when Charles W. Pusey, president; William W. Pusey, treasurer, and Charles H. Heald, a relative of the Puseys, who was a director, retired from the company. In their places William R. Brinckle, John S. Rossell and James A. Hart, all of the Security Trust & Safe Deposit Company, were elected directors. The directors elected Thomas H. Savery president, John S. Rossell treasurer, and Samuel C. Biddle was re-elected assistant treasurer and secretary. Mr. Savery was formerly vice-president. The trust company are to finance the company, who are one of the oldest concerns in that city, making paper and sugar mill machinery and building iron vessels.

The Bullard Machine Tool Company of Bridgeport, Conn., are about to occupy their new building, a crane section, 40 x 112 feet, one story high, with 26 feet under hook of crane. A 20-ton Pawling & Harnischfeger crane has been installed.

The H. C. Coyle Iron Works, Philadelphia, have been incorporated with $10,000 capital stock by Annie M. Coyle, William Carroll of Philadelphia, and Henry C. Esting of Ambler, Pa.

For the second time this year the Geiser Mfg. Company of Waynesboro, Pa., this week booked an order for threshing machinery for the Khedive of Egypt, to be used on his farms along the Nile River. The Geiser company this week completed the iron work for a 70-foot high water reservoir and purchased land adjoining the works for the enlargement of the plant in the near future. Last year's business broke all the records of the company, but 1903 promises to be even better. The company all told this week booked orders for 20 carloads of agricultural machinery.

The Harrisburg Pipe & Pipe Bending Company expect to use their three large new buildings by July 1. The work has been delayed by inability to secure material.

The Weaver-Hirsh Company, Allentown, Pa., engineers, founders and machinists, have made an assignment for the benefit of their creditors. The company have one of the best equipped foundries in Lehigh County, and since their organization three years ago have dealt heavily in steam road rollers. In addition to their foundry the company own a machine shop and about 3 acres of land. Some time ago the company extended their plants to take care of increased business, and entered into a contract with a New York firm for the manufacture of a large number of road rollers. These were not delivered promptly on account of the inability of the Weaver-Hirsh company to secure boilers for the machines, on account of the boiler shops being overcrowded with orders, and the New York firm sued for heavy damages, which seriously affected the credit of the company. E. E. Weaver is president and the capital stock is $200,000. The mill employed 200 hands. Frank Jacobs of Allentown, Pa., is assignee.

The Hill Mfg. Company, Lewiston, Maine, are building a large machine shop and storehouse. Lockwood, Greene & Co. of Boston are the architects.

The Mey Chain Belting Engineering Works of Buffalo, N. Y., have been purchased by H. F. Mayer of that city and the plant removed from Columbia street to the corner of Perry and Washington streets, where the manufacture of chain belting and chain belting machinery will be continued under the same name as before the change in proprietorship.

Machinery, tools, castings, sheet iron, wire, metal wheels, iron rods, &c., are required by the Penn Novelty Company, Canton, Ohio, recently organized with a capital of $10,000. The company have purchased the equipment of D. F. Lang and will manufacture patented velocipede wagons and other novelties. They purpose to increase their capital and capacity within a year, and at that time add the manufacture of metal wheels and a line of business vehicles. The officers are F. W. Feigel, president; A. B. McVay, vice-president, and P. S. Loutzenhiser, secretary and treasurer.

The Glenville Foundry & Machine property, at Glenville, Pa., was offered for sale last week, bid up to $2050 and withdrawn. The owners will again offer the plant for sale in a short time.

Baugher, Kurtz & Co., Limited, of York, Pa., last week shipped to the Rockdale Powder Company of Maryland a large addition to their powder mill machinery. They also have booked and are working on complete sets of machinery to be consigned to Illinois, Pennsylvania and Tennessee powder mill companies.

It has been previously mentioned in our columns that the J. L. Mott Iron Works, New York, were erecting at Trenton, N. J., where they already have a large pottery, a plant for the manufacture of plumbing goods of all kinds that in extent and equipment will, it is said, surpass any similar plant in the world. It will include brass and iron foundries, enameling works, machine and other shops adapted to their requirements. To this end announcement is made of the incorporation of the J. L. Mott Company at Trenton, N. J., with a capital stock of $3,000,000, the incorporators being identified with the New York concern. Some of the buildings of the new plant have already reached a state that their equipment is being set up and work on the entire plant is progressing.

The Libbe Engineering & Construction Company of Toledo incorporated under the laws of Michigan with $300,000 capital stock, are preparing to enlarge their factory with a view of producing in quantities a new trench digging machine which they have recently perfected. The device is operated by a gasoline engine and but one operator is required to handle it. M. J. Garvin is manager of the company.

The Winton Motor Carriage Company of Cleveland are placing contracts for the erection of a new machine shop. This is in addition to the factory additions now under way.

Contracts have been awarded by William Glyde Wilkins, engineer of Pittsburgh, for the equipment of the mines of the United States Coal & Oil Company, in Logan County, W. Va. Several of the contracts were secured by Pittsburgh firms. The General Electric Company of Schenectady, N. Y., were awarded the contract for two 300-kw. alternating current generators, one 200-kw. direct current generator, three electric mining locomotives and a number of small motors. The Ball & Wood Engine Company of Elizabeth, N. J., secured the contract for two 450 horse-power and one 300 horse-power Corliss engines, to operate the generators. The Atlas Engine Company of Indianapolis will furnish eight 150 horse-power tubular boilers. The Aultman-Taylor Company of Canton, Ohio, have the contract for four sets of screen equipment for the tipples, and the Arctic Machinery Company of Canton will install a complete artificial ice plant. Bellinger Bros. of Pittsburgh will supply two chain car hauls to elevate the cars from the mines to the tipples, and Strong, Carlisle, Hammond & Co. of

Cleveland have the contract for the machine tools for the shops. The United States Coal & Oil Company, which will own and operate the mines, have recently bought 30,000 acres of coal and surface land in Logan County and will open a new and very fertile field. Work on the new mines is already well under way, and when they are in operation they will have a capacity of 6000 tons of coal a day. Within a year the company expect to double this output.

The New York, Chicago & St. Louis Railway Company have commenced work on additions to their shops at Conneaut, Ohio. The addition to the machine shop will be 90 x 190 feet, and the new wood working and carpenter shop will be 53 x 105 feet. There will also be a new boiler shop and a paint shop.

The Wellman-Seaver-Morgan Company of Cleveland, recently formed by the consolidation of the Wellman-Seaver-Morgan Engineering Company and the Webster, Camp & Lane Company of Akron, have filed a mortgage for $800,000 given to the Cleveland Trust Company. They agree to pay $100,000 of the bonded indebtedness and $338,000 of the floating indebtedness of the Webster, Camp & Lane Company, and $400,000 of the bonded indebtedness and $309,000 of the floating indebtedness of Wellman-Seaver-Morgan Engineering Company. The mortgage covers the plants in Cleveland and Akron.

The Central Market Street Railway Company of Columbus, Ohio, are erecting new repair shops, where they propose to take care of the repair work on cars of their own system as well as those of the Columbus, London & Springfield and Columbus, Grove City & Southwestern interurban lines. They will install a crane, hydraulic pit jacks, two lathes, drill press, shaper, wheel press and other machine shop equipment, besides buzz saw, circular saw and band saw for carpenter work.

The Philadelphia Pneumatic Tool Company, Philadelphia, Pa., recently furnished all the pneumatic tools for the erection of 45 steel bridges, which the Southern Pacific Company are erecting incident to the straightening of their line between Ogden, Utah, and Reno Nev. Large orders for chipping hammers, riveters and drills have been received also from the Baldwin Locomotive Works, Pennsylvania Steel Company, American Bridge Company and the Vulcan Iron Works, Toledo, Ohio.

### Power Plant Equipment.

The Herendeen Mfg. Company, Geneva, N. Y., manufacturers of Furman boilers and radiators, will erect a large addition to their plant to take care of their increased business. The company purchased a piece of property some time ago, where they will undoubtedly erect a new plant in the near future for the manufacture of a complete line of heating apparatus.

The Houghton County Electric Light Company of Marquette, Mich., will build an extension to their boiler house at the Houghton plant and install two additional 300 horse-power boilers.

The Sheffield Railway Company, Sheffield, Tenn., are constructing an electric road from Sheffield to Florence and Tuscumbia, Ala. In addition they are building a lighting plant for the three cities and a water works system for Sheffield and Tuscumbia.

The Unique Power Light & Water Company, Cambria, Va., will erect an electric plant and water works at Christiansburg.

It is stated that bids are asked until May 20 for the construction of water works at Fayette, Iowa, including 80 horse-power boiler and steam engine, 700,000-gallon duplex high pressure pump, water heater, feed pump, &c. George A. Oliver is Mayor.

Bigelow & Co. of New Haven, Conn., are now manufacturing internally fired boilers. A recent order is for two of these boilers of 250 horse-power each for the new estate of John Jacob Astor on the Hudson.

The Albany Canal & Water Company, Albany, Ore., are building a new power plant, which they expect to have in operation about August 15. The equipment has been purchased and includes a 100-kw. General Electric generator, Frick-Corliss engine, Twin Victor turbine and Kewanee return tubular boiler. In addition there will be installed from the old station now in operation an 80 horse-power boiler and 60-kw. generator.

The Bureau of Supplies and Accounts, Navy Department, Washington, are receiving bids until May 26 for a power plant equipment at the League Island Navy Yard.

The Glen Mfg. Company, Ellwood City, Pa., will be in the market in July for a steam heating plant.

### Bridges and Buildings.

The Worden-Allen Company, Milwaukee, Wis., recently secured for their new plant a site on the Port Washington road about ½ mile north of the city limits. The company have moved into their new office building and materials for the construction of the various other buildings are being received. It is expected that operations will begin at the plant within 60 days. This company were organized some months since by Beverly L. Worden, formerly construction engineer for the Milwaukee Bridge & Iron Company, and Clarence J. Allen, for the purpose of bridge building and the manufacture of structural iron work. The capital stock is $100,000

The Indiana Bridge Company, Muncie, Ind., are filling an order for the United States Government for three range lighthouses for Lake Michigan, at South Haven, Chicago breakwater and Muskegon.

The contracts for the erection of the immense steel repair and machine shops of the Delaware, Lackawanna & Western Railroad Company at Keyser Valley, near Scranton, Pa., have all been let to Scranton companies.

### Foundries.

The Whiting Foundry Equipment Company, Harvey, Ill., it is announced, have increased their capital stock from $270,000 to $400,000.

The Home Stove Company of Indianapolis, Ind., having their factory in that city, will have a similar plant at Greenfield, where the original plant was before the removal to Indianapolis. The citizens of Greenfield have agreed to rebuild the plant.

The William Adams Foundry Company, Philadelphia, Pa., have been incorporated with a capital stock of $150,000 by William Adams, J. K. Bougher, W. H. Hunt and E. T. Dinlay.

### Fires.

The plant of the Consolidated Paper & Bag Company, Elkhart, Ind., was destroyed by fire May 8, causing a loss of about $75,000.

The Hartian Paper Company's plant at Middleport, N. Y., was destroyed by fire May 6. The loss is placed at $50,000.

The Sperry Foundry Company's plant at Aurora, Ill., was recently burned, entailing a loss of about $50,000.

Fire at the Traverse City Iron Works, Traverse City, Mich., partially burned the machine shop, causing a loss of $3000; nearly destroyed the mill supply stock, loss $11,500, and damaged tools to the extent of $3000. Benjamin Thirlby and Wm. F. Calkins, owners of the plant, will rebuild at once.

The Shipman Coal Company's colliery breaker at Shamokin, Pa., valued at $40,000, was destroyed by fire May 12.

### Hardware.

Sargent & Co., New Haven, Conn., are about to occupy new buildings, one 50 by 154 feet, four stories; the other, 50 by 241 feet, one story. The new space is for general lines of manufacture.

The Andrew B. Hendryx Company, New Haven, Conn., have largely increased their plant by the purchase of the adjoining property from the I. N. Dann Rattan Company. The buildings acquired consist of one 40 by 185 feet, four stories; one 40 by 80 feet, four stories, and a third, 40 by 80 feet, two stories. The last named building is completely equipped for a gas plant, with modern improvements, including sprinkler system. The Hendryx Company, who manufacture bird cages, cage specialties, safety chain, jack chain, wire picture cord, fishing tackle, &c., had much outgrown their plant. The business was congested with excess machinery, raw material and stock. It will take all the new buildings to care for the immediate overflow from the old buildings. In the new property is a Harris-Corliss engine of ample power to operate all the required machinery.

B. F. Stinson & Co., manufacturers of Easybright polishes and metal polishes, Buffalo, N. Y., have removed their factory from Indiana street to their new four-story building at Niagara and Maryland streets.

The Emmert Mfg. Company of Waynesboro, Pa., are at present manufacturing a large order of vises for Canada and Kentucky firms. The company this week commenced the erection of a new brick office building and storage house.

The L. & I. J. White Company, Buffalo, N. Y., manufacturers of machine knives and edge tools, are erecting an addition to their plant which will double its capacity. They are also adding up to date appliances to their equipment to enable them to meet the demands of their rapidly increasing business.

The Buffalo Wire Works Company, Buffalo, N. Y., are completing a five-story addition to their factory, and equipping same with modern wire working machinery, which will be electrically driven. The machinery in the older portion of their plant is also being fitted for operation by electricity. Niagara Falls power will be used.

The E. Howard Clock Company, Boston, have lately installed the following: Watchman clock systems for the American Axminster Industry, Auburn, N. Y., and the Stillwater Mfg. Company, Stillwater, Minn.; a large tower clock with bell for the Court House at St. Francisville, La., and a tower clock with 8-foot dials for the Congregational Church at Holliston, Mass. They have also made two special bronze clocks for the interior of the New York Stock Exchange, and erected a fine post clock for the Lorimer-Wright Company, Providence, R. I.

E. R. Wagner Mfg. Company, manufacturers of vehicle hardware, sheet metal stampings and hardware specialties, North Milwaukee, Wis., are building a fire proof iron warehouse, 40 x 100 feet. During the past year their business in the line of sheet metal stampings has increased very largely, so that they are badly crowded for room.

Mayer & Co., manufacturers of Gold Medal files, Philadelphia, Pa., are contemplating additions to their plant, the demand

for their various lines of files necessitating an increase of facilities. New file making, grinding and other machinery will also be installed, and the new buildings will be erected as soon as possible. We are advised that a large number of orders for Gold Medal files are being received from the Middle and Far West, while the demand in the East continues to grow.

The Goodell-Pratt Company of Greenfield, Mass., manufacturers of automatic drills, hack saws, &c., are to erect this season a new building for offices, stock and shipping rooms. The building will be of brick, 40 by 80 feet on the ground, and three stories high. When the new building is occupied the space now occupied by the offices and shipping and stock rooms will be given over to general manufacturing.

Thirteen of the 14 grinders employed by Nichols Bros., manufacturers of butchers' tools at Greenfield, Mass., went on strike last week. They demand the union scale of wages. These men have piece work, and while the union scale is somewhat higher than that paid by Nichols Bros., yet the men received larger wages. This is because the union rule restricts the amount of work that a grinder may do in a day. Men who have recently worked in a union shop, under the union scale, state that they can earn more wages at Nichols Bros. than under the other conditions.

Henry Disston & Sons, Incorporated, Tacony, Philadelphia, will build two two-story additions, 30 x 62 feet and 24 x 30 feet, respectively, to their saw handle factory and to building No. 5, on Unruh street, east of State road, Tacony.

**Miscellaneous.**

A contract for the erection of the blacksmith shop at the Hawthorne plant of the Western Electric Company has been awarded to S. A. Treat. The shop will be of brick and stone construction, 76 x 200 feet and will cost $27,000. The contracts for the new plant of the Western Electric Company awarded thus far aggregate $1,084,000.

The Round Top Hydraulic Cement Company, Hancock, Md., will rebuild their plant, which was recently burned, but as yet have no plans matured.

## The Clairton Steel Company.

(*By Telegraph.*)

PITTSBURGH, PA., May 13, 1903.—On Tuesday, May 12, a large party of officials of the Crucible Steel Company of America and the Clairton Steel Company of Pittsburgh, together with a number of prominent bankers and manufacturers of Pittsburgh, went in a special train to Clairton to visit the blast furnaces and open hearth steel works of the Clairton Steel Company at Clairton, Pa. The party was headed by W. P. Snyder, president of the Clairton Steel Company, and Frank B. Smith, president of the Crucible Steel Company of America. Some of the officials of these two concerns had never before visited the plants, while others had seen them only in their early inception, and this visit was for the purpose of inspecting the blast furnaces and open hearth steel works already completed and in operation. At the present time the Clairton Steel Company have one blast furnace in operation, running almost exclusively on Mesaba ore and which is turning out from 425 to 450 tons of Bessemer iron per day. No. 2 Furnace has been completed, the blast has been turned on and the furnace will be blown in next week. It is a duplicate of No. 1, being 20 x 85 feet in size. The open hearth plant embraces 12 50-ton furnaces, ten of which are in operation turning out from 850 to 900 tons of open hearth blooms and billets per day. However, it was to the material improvements and additions to be made by the Clairton Steel Company to which special attention was paid by the visitors. These include a three-high 28-inch mill, which is almost completed and which will be used for rolling sections under 8 inches. There will be hooked onto this mill two auxiliary mills, one to be used for rolling structural shapes consisting of beams from 6 inches up to 20 inches in size, also angles, channels, tees and other shapes. On the other auxiliary mill sheet and tin plate bars will be rolled, to be sold to outside sheet and tin mills. The Clairton Steel Company have plans under way for other large additions to their works. These include the building of a fourth blast furnace and also the installment of two 10-ton Bessemer converters, it being the intention of the Clairton Steel Company to bring their capacity for turning out open hearth and Bessemer steel up to 3000 tons a day. It is about likely that a slabbing and plate mill will be installed in case it is decided to add another blast furnace and Bessemer plant.

The record of No. 1 blast furnace, which has been running almost exclusively on 100 per cent. Mesaba ore, is a remarkable one, the furnace never having gone below 421 tons in 24 hours. When the pressure and burden have been increased, which will be done shortly, the furnace is expected to make 500 tons a day or more. When the present plans of the Clairton Steel Company have been carried out, this concern will have one of the finest blast furnace, Bessemer and open hearth steel plants in the country. The finished product to be turned out will include billets, sheet and tin plate bars, plates and structural shapes.

## Loomis-Pettibone Gas Machinery Company to Erect Plant.

A large plant will be erected by the Loomis-Pettibone Gas Machinery Company, whose offices are at 52 and 54 William street, New York, on a 120-acre site, adjacent to the Pennsylvania and Baltimore & Ohio railroads, in Linden township, close to South Elizabeth, N. J. Plans and specifications are completed and the company are ready to receive bids for the construction of the several buildings, as well as for the complete equipment of machinery, an extensive list of which was issued early in the week.

The plant will consist of six extensive buildings of brick and steel, the largest of which will be the producer shop, 100 x 680 feet. Parallel to this building will be the machine shop proper, consisting of two buildings joined together, one 65 x 600 feet, and 40 feet high; the other 65 x 600 feet, and 17 feet high. The foundry, 112 x 500 feet, will be connected with the machine shops by a covered storage space, 175 feet, in which will be installed a 65-foot Gantry crane of 40 tons capacity. The erecting shop will be 40 x 150 feet, and the pattern and storage house 112 x 200 feet.

A 1200 horse-power producer plant will be installed for testing engines and for furnishing gas to run the 500 horse-power engine in the power plant. Gas from this plant will also be used for the core ovens, drying molds, forges and for heating purposes. The plant will be operated throughout by electricity.

The company will manufacture gas engines in large units, in addition to the Loomis-Pettibone gas apparatus, which they will continue to manufacture as heretofore. Cyrus Robinson, vice-president and general manager, is the engineer in charge.

## Fluctuation in Iron Stocks.

The following table shows the extent of transactions and the fluctuations in quotations of the stocks of iron and steel companies in the month of April, with the dates on which the highest and lowest prices on each stock were realized:

| Cap'l issued. | | Sales. | Low-Date est. | Apr. | High-Date est. | Apr. |
|---|---|---|---|---|---|---|
| $41,233,300 | Am. Can, com..... | 18,800 | 6⅞ | 28 | 9¼ | 21 |
| 41,233,300 | Am. Can. pref..... | 47,800 | 41½ | 28 | 50¾ | 21 |
| 29,000,000 | Am. Car & F'dry, com. | 29,500 | 38¼ | 14 | 41⅝ | 6 |
| 29,000,000 | Am. Car & F'dry, pref. | 6,150 | 89½ | 14 | 92 | 7 |
| 24,100,000 | Am. Loco., com..... | 28,900 | 25¼ | 13 | 28¼ | 23 |
| 25,000,000 | Am. Loco., pref..... | 4,600 | 92 | 13 | 95⅛ | 1 |
| 45,000,000 | Cambria Steel..... | 12,600 | 23½ | 14 | 25 | 17 |
| 7,000,000 | Cent. Foundry, com.. | 6,300 | 3 | 15 | 4 | 30 |
| 7,000,000 | Cent. Foundry, pref.. | 2,150 | 15 | 16 | 18 | 30 |
| 17,000,000 | Col. Fuel & Iron..... | 91,000 | 54 | 3 | 66⅛ | 27 |
| 25,000,000 | Crucible Steel, com... | 10,300 | 18 | 14 | 18⅞ | 1 |
| 25,000,000 | Crucible Steel, pref... | 19,700 | 82 | 6 | 84 | 1 |
| 1,975,000 | Diamond State Steel. | 1,000 | ½ | 16 | 1¼ | 18 |
| 2,368,100 | Empire I. & S., com.. | .... | 13 | 30 | 15 | 9 |
| 2,281,400 | Empire I. & S., pref.. | .... | 44 | 3 | 50 | 30 |
| 4,449,800 | Otis Elevator, com... | 500 | 40 | 6 | 44¾ | 1 |
| 6,350,000 | Otis Elevator, pref... | 700 | 93½ | 16 | 96 | 30 |
| 10,750,000 | Pa., new, com., Phila. | 100 | 50 | 14 | 50 | 14 |
| 16,500,000 | Pa., new, pref., Phila. | 350 | 91½ | 27 | 95 | 3 |
| 12,500,000 | Pressed Steel, com... | 9,650 | 60 | 13 | 61¾ | 23 |
| 12,500,000 | Pressed Steel, pref... | 3,700 | 91½ | 29 | 94½ | 23 |
| 10,000,000 | Railway Spr., com... | 6,700 | 30 | 14 | 34 | 4 |
| 10,000,000 | Railway Spr., pref.... | 2,200 | 85½ | 13 | 87 | 27 |
| 27,191,000 | Rep. I. & S., com.... | 15,600 | 17⅞ | 13 | 20¼ | 22 |
| 20,306,900 | Rep. I. & S., pref..... | 6,600 | 75⅞ | 13 | 79 | 21 |
| 7,500,000 | Sloss-Shef. S. & I.,com.. | 10,000 | 55 | 16 | 63 | 30 |
| 6,700,000 | Sloss-Shef. S. & I., pref. | 600 | 91 | 8 | 94 | 14 |
| 20,000,000 | Tenn. Coal & Iron.... | 63,505 | 61 | 13 | 66⅛ | 22 |
| 1,500,000 | Tidewater Steel..... | 1,000 | 3 | 13 | 4 | 13 |
| 12,106,000 | U. S. C. Pipe, com.... | 1,300 | 12 | 25 | 13¼ | 23 |
| 12,106,000 | U. S. C. Pipe, pref... | 1,500 | 50 | 21 | 53¼ | 30 |
| 510,361,300 | U. S. Steel Co., com.. | 317,400 | 34⅞ | 16 | 36¼ | 22 |
| 508,511,200 | U. S. Steel Co., pref.. | 220,000 | 83 | 13 | 87⅝ | 22 |
| 8,425,000 | Vir. I. & C., com..... | 4,100 | 30 | 14 | 34½ | 29 |
| 1,500,000 | Warwick I. & S..... | 400 | 5 1/16 | 7 | 5⅛ | 21 |
| | Allis-Chalmers, com... | 600 | 16 | 20 | 17 | 29 |
| | Allis Chalmers, pref... | 100 | 86 | 15 | 86 | 15 |
| | Am. Steel F'dries, com | 7,500 | 14 | 8 | 17¼ | 22 |
| | Am. Steel F'dries, pref | 800 | 59 | 27 | 61 | 6 |
| | Dominion I. & S..... | 41,000 | 24 | 1 | 30½ | 29 |
| | U. S. S. Co., new 5s. | 5,548,000 | 83¼ | 14 | 86½ | 23 |

# The Iron and Metal Trades.

Our monthly blast furnace statistics are particularly interesting because they show that production is going on at a tremendous rate, the output in April having been very close to 1,650,000 tons. Even that record output promises to fall behind the tonnage of this month, which we entered with a capacity of 383,897 tons per week, as compared with 376,576 tons on April 1. On the basis of these figures the May production should reach 1,700,000 gross tons.

The surprising and most significant fact, however, is that the stocks reported, which do not include the Steel works using their own Pig, show a decline from 170,757 tons on April 1 to 162,742 tons on May 1.

It may be interesting to note that of the total production in April of 1,608,431 tons of Anthracite and Coke Iron, 945,235 tons was produced by the Steel works, which include the plants of the United States Steel Corporation, the Bethlehem, Maryland, Pennsylvania, Lackawanna, Cambria, Jones & Laughlin, Colorado and Republic.

These figures are eloquent proof of the fact that consumption of Pig Iron is taking not alone our own enormous production, but also the current importations. Statistically the situation is therefore thoroughly sound.

Yet consumers are holding off, particularly in the Foundry trade, and their attitude seems justified to some extent by the facts. Prices had gone to an unnatural figure, from which they have been and are still receding. Last year leading interests in the South made a frantic but ineffective effort to hold down the market to the basis of $12.50 for No. 2 Foundry Iron at Birmingham, and yet the market went as high as $20. At the time they openly proclaimed that $12.50 was satisfactory. Now some of them are struggling to hold values at $17.50, when outside interests are selling down to $15.50. At the former figure there is still a chance for importations and we are not safe even at $15.50.

Another element is that a large part of the new capacity which has entered the market is that of the Steel companies, which will cut down their outside purchases. This puts pressure on the Bessemer furnaces of the Central West, who may be expected to turn to the foundry trade for relief.

These are elements in the favor of the buyers. On the other hand the sellers may point with confidence to the tremendous consumption on the part of the foundries, and to the fact that in spite of large commitments for Castings the founders have not covered. A rush is bound to come; it remains to be seen at what price the deadlock will be broken.

Some ridiculous reports have been circulated in Wall Street concerning a sudden break in Billets in Pittsburgh. There is no truth in them. There is still scarcity of Steel in that market. As a matter of fact, the Steel market in Pittsburgh has become a very restricted and unimportant affair. The great mills either roll their own Steel, or have sliding scale contracts with the great Steel works, which gives them the metal at much lower prices than those quoted in the market. The latter is restricted to the relatively small quantities which the smaller outside mills must purchase from time to time. The Eastern market, with its larger number of independent rolling mills, which must buy Steel, is more important. These are supplied by the domestic Steel works or by importers of foreign Steel, who are still receiving inquiries. The price in the tidewater market has been $28 to $28.50 for both foreign and domestic for some weeks, with a fair amount of tonnage being placed.

## A Comparison of Prices.

**Advances Over the Previous Month in Heavy Type, Declines in Italics.**

At date, one week, one month and one year previous.

| | May 13, 1903. | May 6, 1903. | Apr. 15, 1903. | May 14, 1902. |
|---|---|---|---|---|
| **PIG IRON:** | | | | |
| Foundry Pig No. 2, Standard, Philadelphia | *$20.25* | $21.00 | $21.00 | $19.75 |
| Foundry Pig No. 2, Southern, Cincinnati | *19.25* | 19.25 | 20.20 | 18.75 |
| Foundry Pig No. 2, Local, Chicago | *20.00* | 21.50 | 22.00 | 21.00 |
| Bessemer Pig, Pittsburgh | *20.00* | 20.10 | 21.50 | 21.00 |
| Gray Forge, Pittsburgh | *19.75* | 20.00 | 20.25 | 19.75 |
| Lake Superior Charcoal, Chicago | *24.00* | 24.50 | 25.00 | 23.00 |
| **BILLETS, RAILS, ETC.:** | | | | |
| Steel Billets, Pittsburgh | 30.50 | 31.00 | .... | 32.00 |
| Steel Billets, Philadelphia | 28.50 | 28.50 | 28.50 | 33.50 |
| Steel Billets, Chicago | 32.50 | 32.60 | .... | .... |
| Wire Rods, Pittsburgh | 37.00 | 37.00 | 37.00 | 37.00 |
| Steel Rails, Heavy, Eastern Mill | 28.00 | 28.00 | 28.00 | 28.00 |
| **OLD MATERIAL:** | | | | |
| O. Steel Rails, Chicago | *18.25* | 18.50 | 18.50 | 17.50 |
| O. Steel Rails, Philadelphia | 21.50 | 21.50 | 21.50 | 21.00 |
| O. Iron Rails, Chicago | *24.00* | 24.50 | 24.50 | 24.00 |
| O. Iron Rails, Philadelphia | *24.50* | 24.50 | 25.00 | 24.00 |
| O. Car Wheels, Chicago | *23.00* | 24.00 | 24.00 | 20.00 |
| O. Car Wheels, Philadelphia | 24.00 | 24.00 | 24.00 | 19.50 |
| Heavy Steel Scrap, Pittsburgh | 21.50 | 21.50 | 21.50 | .... |
| Heavy Steel Scrap, Chicago | 18.25 | 18.50 | 18.25 | 17.50 |
| **FINISHED IRON AND STEEL:** | | | | |
| Refined Iron Bars, Philadelphia | *1.85* | 1.93½ | 1.93½ | 1.95 |
| Common Iron Bars, Chicago | *1.80* | 1.85 | 1.85 | 1.90 |
| Common Iron Bars, Pittsburgh | 1.85 | 1.89¾ | 1.85 | 1.80 |
| Steel Bars, Tidewater | 1.75 | 1.75 | 1.75 | 1.80 |
| Steel Bars, Pittsburgh | 1.60 | 1.60 | 1.60 | 1.60 |
| Tank Plates, Tidewater | *1.80* | 1.80 | 1.85 | 1.95 |
| Tank Plates, Pittsburgh | 1.60 | 1.60 | 1.60 | 1.60 |
| Beams, Tidewater | 1.73½ | 1.73½ | 1.73½ | 2.00 |
| Beams, Pittsburgh | 1.60 | 1.60 | 1.60 | 1.60 |
| Angles, Tidewater | 1.73½ | 1.73½ | 1.73½ | 2.00 |
| Angles, Pittsburgh | 1.60 | 1.60 | 1.60 | 1.60 |
| Skelp, Grooved Iron, Pittsburgh | 2.05 | 2.05 | 2.00 | 2.25 |
| Skelp, Sheared Iron, Pittsburgh | 2.10 | 2.10 | 2.05 | 2.25 |
| Sheets, No. 27, Pittsburgh | 2.65 | 2.65 | 2.65 | 2.95 |
| Barb Wire, f.o.b. Pittsburgh | 2.60 | 2.60 | 2.60 | 2.90 |
| Wire Nails, f.o.b. Pittsburgh | 2.00 | 2.00 | 2.00 | 2.05 |
| Cut Nails, f.o.b. Pittsburgh | 2.15 | 2.15 | 2.15 | 2.05 |
| **METALS:** | | | | |
| Copper, New York | *14.75* | 14.75 | 15.00 | 12.12½ |
| Spelter, St. Louis | 5.40 | 5.40 | 5.40 | 4.15 |
| Lead, New York | *4.37½* | 4.37½ | 4.65 | 4.10 |
| Lead, St. Louis | *4.22½* | 4.22½ | 4.57½ | 4.00 |
| Tin, New York | *29.65* | 29.90 | 29.65 | 29.90 |
| Antimony, Hallett, New York | 7.00 | 7.00 | 7.00 | 8.00 |
| Nickel, New York | 40.00 | 40.00 | 40.00 | 50.00 |
| Tin Plate, Domestic, Bessemer, 100 pounds, New York | 3.99 | 3.99 | 3.99 | 4.19 |

## Chicago.

FISHER BUILDING, May 13, 1903.—(*By Telegraph.*)

The lower prices for Pig Iron revealed about a week ago have encouraged a few buyers to increase purchases, a few transactions covering the third quarter of the year. As a rule, however, the demand has continued mainly for the balance of the first half, and while some large purchasers are testing the market the inquiries have not resulted in the placing of a large tonnage. In sympathy with the decline in Pig Iron, there has been a sharp break in the prices for Old Material, which has again been reflected in the market for Bar Iron, lower prices being more openly made, with some little increase in business. The general market, however, is still extremely dull, and nearly all lines of Steel have been very slow, with a disappearance of premiums for prompt shipments and an easier feeling, although this has not been carried to the extent of radical change in prices. The sluggishness in most lines of Steel is attributed primarily to the unfavorable labor situation, which has prevented a continued free distribution of Steel in consumptive channels, resulting in a congestion of stocks in the hands of some jobbers. This has been especially apparent in the line of Structural Material, but has also affected Sheets and Plates. Steel Bar mills, too, are hungry for orders, a more active solicitation for trade being made than for many months. While there has been some relief from the stringency of Billets and Sheet Bars, an easier tone has developed in the former, in sympathy with foreign material, which has been offered at lower prices. It is reported that other mills have been turned from Plates and Bars upon the production of Billets. While Implement manufacturers are said to have covered their requirements for

Agricultural Shapes to about an equal extent as a year ago, their purchase of Bars has been relatively small. Coke has continued slow and easy.

**Pig Iron.**—Buyers of Pig Iron have been quick to recognize the significance of the active competition for business which was revealed in the placing of the Pullman contract for 2500 tons as noted a week ago, the result being that trading during the past week has been on a much lower basis than heretofore, and has been taken advantage of by a few shrewd buyers, the aggregate tonnage sold being larger than for many weeks. One or two large consumers, too, have been taking the pulse of the market, but seem in no hurry to close contracts. A few orders for 500 to 1000 tons have been placed for deliveries running through the third quarter, and one exceptional transaction covers the entire last half of the year. As a rule, however, buying has been in 100 to 200 ton lots and for delivery during the next two to three months. The tone or lack of tone of the market is evident from concessions which buyers have been able to obtain under what may be termed quiet buying. The association furnaces are believed not to have departed radically from their previous policy. This seems reasonable when it is known that the largest association interest are still 40,000 and another 25,000 tons behind in the filling of contracts, most of which were taken at prices below the level of to-day's markets; but some radical change in policy is expected by June 1. In the meantime the market is in what is termed in philosophy the critical state. The most important buyers in the market during the week have been Pipe and Radiator manufacturers, although Agricultural Implement makers and rolling mills are preparing to become more important factors. The largest transaction of the week aggregates about 3000 tons, which has been picked up in lots of from 400 to 750 tons, and has included Nos. 2, 3 and 4 Foundry and Gray Forge, at approximately $15.50, $15, $14.50 and $14, Birmingham, respectively, for delivery during June, July, August and September. Nos. 3 and 4 sold together at $14.65, Birmingham, basis. Other sales of No. 2 as high as $16, Birmingham. Car wheel works, too, have made a supplementary purchase of 400 tons of Virginia Iron, running about 6 per cent. in Silicon, at approximately $22.35, delivered Pullman, for delivery in July, August, September and October. The offerings of Silvery Iron are relatively liberal, and 50c. to $1 per ton lower than a week ago has been accepted for Southern Iron, and radically lower prices have been made by Ohio and Kentucky furnaces making this grade of Iron. Radiator manufacturers have purchased several lots, aggregating about 1500 tons, at about inside quotations, it is reported. It should be noted, however, that so much trading is made on analysis that it is difficult to give the exact figures, according to grade. The competition for orders by several new furnaces making Foundry Iron in the North is said to be responsible for the low prices prevailing in that section. Basic Iron has been little better than nominal, and trading in Bessemer Iron has been light, but at a little lower range of prices, and mainly in single car lots. List prices have been revised to conform to the radically lower prices made by Northern producers and independent Southern furnaces, the inside prices being for delivery during the third and fourth quarters and the outside prices for quick shipment:

| | |
|---|---|
| Lake Superior Charcoal | $24.00 to $25.00 |
| Local Coke Foundry, No. 1 | 21.00 to 22.00 |
| Local Coke Foundry, No. 2 | 20.00 to 21.00 |
| Local Coke Foundry, No. 3 | 19.00 to 20.00 |
| Local Scotch, No. 1 | 21.50 to 22.50 |
| Ohio Strong Softeners, No. 1 | 22.50 to 23.50 |
| Ohio Strong Softeners, No. 2 | 21.80 to 22.30 |
| Southern Silvery, according to Silicon | 21.85 to 23.85 |
| Southern Coke, No. 1 | 20.35 to 20.85 |
| Southern Coke, No. 2 | 19.85 to 20.35 |
| Southern Coke, No. 3 | 19.35 to 19.85 |
| Southern Coke, No. 1 Soft | 20.10 to 20.60 |
| Southern Coke, No. 2 Soft | 19.60 to 20.10 |
| Foundry Forge | 18.85 to 19.35 |
| Southern Gray Forge | 18.35 to 18.85 |
| Southern Mottled | 18.10 to 18.60 |
| Southern Charcoal Softeners, according to Silicon | 24.85 to 26.85 |
| Alabama and Georgia Car Wheel | 28.85 to 29.85 |
| Malleable Bessemer | 21.00 to 21.50 |
| Standard Bessemer | 21.30 to 21.80 |
| Jackson County and Kentucky Silvery, 6 to 8 per cent. Silicon | 27.30 to 28.30 |

**Bars.**—A weaker tone has been developed for Bar Iron under more free offerings from the mills and lower prices prevailing for both Pig and Scrap Iron. There has been a fair inquiry for small lots, but no large transactions. The demand comes mainly from car shops and railroads, carriage men and implement manufacturers being but slightly represented among the buyers. The largest sale reported is that of 500 tons at 1.80c., Chicago, for delivery during the next few months. Another lot of 250 tons for early delivery has been made at 1.85c., and quite a number of smaller transactions at prices ranging from 1.80c. to 1.90c., Chicago. Steel Bars have been very quiet, only one or two transaction of any significance being consummated, among them being two lots of 1000 tons each, purchased by Implement manufacturers for delivery during the 1903-1904 season. Specifications on old contracts have been more satisfactory during the week, but there is active solicitation for new business. The market remains steady, the following being the prices current, f.o.b. cars, Chicago, mill shipment: Bar Iron, 1.85c. to 1.90c.; Soft Steel Bars, 1.76½c. to 1.86½c.; Hoops, 2.16½c. to 2.26½c.; Angles, under 3 inches, 1.86½c. to 1.91½c., base. The merchant trade has been light, but prices have been sustained as follows: Bar Iron, 2.15c.; Soft Steel Bars, 2c. to 2.25c.; Angles, 2.25c., and Hoops, 2.40c., base, from store.

**Structural Material.**—Dullness has been the most prominent feature of the week, business of all kinds being light and mills being able to make quick shipment of Small Angles and Large Beams and Channels. Trade from local stocks is suffering somewhat. Labor troubles are largely responsible for the present slow market, and the future of the industry is largely dependent upon the settlement of these difficulties. The inside bridge workers at the Lassig works of the American Bridge Company struck on Monday. Prices remain steady as follows, at Chicago, for mill shipment: Beams, Channels and Zees, 15 inches and under, 1.75c. to 1.90c.; 18 inches and over, 1.85c. to 2c.; Angles, 1.75c. to 1.90c. rates; Tees, 1.80c. to 1.90c.; Universal Plates, 2c. to 2.25c. The demand for shipment from local stocks is only moderate and prices unchanged as follows: Beams and Channels, 2¼c. to 2½c.; Angles, 2.25c. to 2.50c.; Tees, 2.30c. to 2.55c., at local yards.

**Plates.**—No large tonnage has been placed during the week, sales being confined to small lots, which aggregate not over 2000 to 3000 tons. The premiums which some independent mills have been obtaining for quick shipments have disappeared, most of the mills now being able to make relatively prompt deliveries. The following are the prices current, f.o.b. cars, Chicago, mill shipment: Tank Steel, ¼-inch and heavier, 1.75c. to 2c.; Flange, 1.85c. to 2.15c.; Marine, 1.95c. to 2.10c. There has been a falling off in the demand from local stocks, there being an easier tone, although prices are well sustained, as follows: Steel, ¼-inch and heavier, 2.15c. to 2.20c.; Tank Steel, 3-16-inch, 2.25c. to 2.30c.; No. 8, 2.30c. to 2.40c.; Flange Steel, 2.40c. to 2.50c., all f.o.b warehouse, Chicago

**Sheets.**—While many of the independent mills are well sold ahead, the largest interest in the market is understood to be able to make prompt shipment on stock sizes, longer time being required only for turning out special sizes. The general tendency is toward an easier market, but prices have not changed essentially. Sales direct from manufacturers are made on the basis of 2.75c., Pittsburgh, or 2.91½c., Chicago, for No. 28. The following are the prices asked by second hands for Black Sheets, carload lots, Chicago, mill shipment: No. 10, 2.12½c. to 2.16½c.; No. 12, 2.22½c. to 2.26½c.; No. 14, 2.32½c. to 2.36½c.; No. 16, 2.42½c. to 2.46½c.; Nos. 18 and 20, 2.56½c. to 2.60½c.; Nos. 22 and 24, 2.66½c. to 2.70½c.; No. 26, 2.76½c. to 2.80½c.; No. 27, 2.86½c. to 2.90½c.; No. 28, 2.96½c. to 3.00½c. Small lots from store sell at from 10c. to 20c. above mill prices. Galvanized Sheets are in moderate demand and barely steady, but without change in prices. For mill shipment 75 and 10 discount, Pittsburgh, and 75 and 5 discount, Chicago, is asked. From local stocks sales are made at 75 and 2½ to 75 discount for quick shipment.

**Cast Pipe.**—Numerous small orders have been received from independent gas and water companies, but the aggregate tonnage has been light and but few municipal contracts have been placed. The tone of the market is easier, in sympathy with Pig Iron, but no radical changes have thus far been made in quotations. Among the sales during the week have been 1000 tons of 4's and 6's to the city of Chicago for early delivery. The city of Minneapolis, in addition to Cast Pipe has purchased about 2000 tons of 48-inch Steel Pipe. Manufacturers continue to sell at the following prices, f.o.b. cars, Chicago, the outside quotations being for small lots: Four-inch, $33 to $34; 6-inch, $32 to $33; 8-inch, $31.50 to $32, and larger, $31 to $31.50, for Water, and $1 per ton higher for Gas Pipe.

**Billets.**—Although there has continued to be an active demand for Billets with the supply adequate, the market has developed a little easier tone in sympathy with freer offerings from abroad at concessions from previous prices. Sales during the week, however, have been small, being confined to three or four lots of domestic Bessemer Billets of 500 tons each at $30, Youngstown, for delivery during June, July and August. There have been offerings of foreign rerolling Billets at $32.50, Chicago, for late summer delivery, but buyers are bidding only 50c. to $1 per ton under these quotations. Small sales of domestic Forging Billet have been made at $34 to $38, Chicago, mill shipment, according to analysis, buyer and time of delivery. Second hands obtain from $1 to $2 per ton over quotations.

**Merchant Pipe.**—Most of the independent mills are said to be well sold, and find difficulty in making prompt shipments even on single sizes, which throws more business into the hands of the largest interest, the tonnage during the week being quite considerable, and the tone of the market firm without change in prices, the following being the official schedule of discounts for carload lots, Chicago, base, random lengths, mill shipment:

| | Steel Pipe. | | Guaranteed Wrought Iron. | |
|---|---|---|---|---|
| | Black. | Galvd. | Black. | Galvd. |
| | Per cent. | Per cent. | Per cent. | Per cent. |
| ⅛ to ⅜ inch | 66.35 | 56.35 | 63.35 | 53.35 |
| ½ inch | 68.35 | 58.35 | 65.35 | 55.35 |
| ¾ to 6 inches | 73.35 | 63.35 | 70.35 | 60.35 |
| 7 to 12 inches | 67.35 | 57.35 | 64.35 | 54.35 |

Less than carloads, 12½ per cent. advance.

**Boiler Tubes.**—Although business has been less active than during the preceding week, there has been a fair volume of business and the market has remained firm, the following schedule of discounts for carload lots, Chicago, being current:

| | Steel. | Iron. |
|---|---|---|
| 1 to 1½ inches | 43.35 | 38.35 |
| 1¾ to 2½ inches | 55.85 | 35.85 |
| 2¾ to 5 inches | 60.85 | 45.85 |
| 6 inches and larger | 55.85 | 35.85 |

Less than carloads, 12½ per cent. advance.

The volume of business experienced by local jobbers has been fair, and the market has remained steady. The following are the discounts from local stock:

| | Steel. | Iron. |
|---|---|---|
| 1 to 1½ inches | 40 | 35 |
| 1¾ to 2½ inches | 50 | 32½ |
| 2¾ to 5 inches | 57½ | 42½ |
| 6 inches and larger | 50 | .. |

**Merchant Steel.**—Agricultural implement manufacturers continue to place orders for requirements for the 1903-1904 season, one or two transactions of this character having been closed during the week. It is reported that sales of Shapes for the coming season have been about equal to what they were a year ago at this time, but contracts for Bars have been very light, much below those made at this time during 1902. There has been a fair demand for Tool Steel and a good demand for Shafting. There is little call for Steel from wagon or carriage manufacturers. The following are the prices current at Chicago for mill shipment: Smooth Finished Machinery Steel, 2.01½c. to 2.11½c.; Smooth Finished Tire, 1.96½c. to 2.11½c.; Open Hearth Spring Steel, 2.66½c. to 2.76½c.; Toe Calk, 2.31½c. to 2.46½c.; Sleigh Shoe, 1.86½c. to 1.96½c.; Cutter Shoe, 2.41½c. to 2.61½c. Ordinary grades of Crucible Tool Steel are quoted at 6c. to 8c. for mill shipment; Specials, 12c. upward. Cold Rolled Shafting in carload lots sells at 47 and in less than carload lots at 42 discount from list.

**Rails and Track Supplies.**—While there has been a fair inquiry for Standard Rails, less business has been consummated during the week, 1000 to 2000 tons covering all transactions. Some sales of second quality have also been made. An interesting feature is the continued active demand for Light Sections throughout the United States, and several inquiries for several thousand tons for shipment to Mexico. Sales in the aggregate during the week have amounted to about 5000 tons from second hands, and about an equal amount from the mills direct. The market has continued strong, and official quotations remain at $28 for Standard and $27 for second quality, mill shipment, Light Rails bringing from $35 to $40, according to weight. Track Supplies have continued active and strong, and independent mills have advanced prices of extras 5c. per lb. on both Railroad and Boat Spikes. The following are the prices current at Chicago for mill shipment: Splice or Angle Bars, 2c. to 2.25c.; Spikes, 2.10c. to 2.25c.; Track Bolts, 3½ to 3¾ inches and larger, with Square Nuts, 2.85c. to 3c.; with Hexagon Nuts, 3c. to 3.25c. From store, 10c. to 15c. over mill prices are asked and obtained.

**Old Material.**—A weaker tone has been developed, in sympathy with Pig Iron, and with freer offerings, especially from the railroads, lower prices have ruled. From 6000 to 10,000 tons of various kinds of Railroad Iron have been sold during the week. The decline has been especially notable in Old Iron Rails, Car Wheels, Fish Plates, Axles, No. 1 Railroad Wrought, Dealers' Forge, Heavy Cast Scrap, Stove Plate and Malleable Iron. Many of the rolling mills have shown a disposition to hold off from large purchases. The following are the prices per gross ton, Chicago:

| | |
|---|---|
| Old Iron Rails | $24.00 to $24.50 |
| Old Steel Rails, mixed lengths | 18.25 to 18.75 |
| Old Steel Rails, long lengths | 22.25 to 22.75 |
| Heavy Relaying Rails | 31.50 to 32.00 |
| Old Car Wheels | 23.00 to 23.50 |
| Heavy Melting Steel Scrap | .... to 18.50 |
| Mixed Steel | 16.00 to 16.50 |

The following quotations are per net ton:

| | |
|---|---|
| Iron Fish Plates | $20.50 to $21.50 |
| Iron Car Axles | 24.50 to 25.00 |
| Steel Car Axles | 23.00 to 23.50 |
| No. 1 Railroad Wrought | 19.50 to 20.00 |
| No. 2 Railroad Wrought | 18.00 to 18.25 |
| Shafting | 20.00 to 21.00 |
| No. 1 Dealers' Forge | 16.00 to 16.50 |
| No. 1 Busheling and Wrought Pipe | 14.00 to 14.50 |
| Iron Axle Turnings | 14.50 to 15.00 |
| Soft Steel Axle Turnings | 14.25 to 14.50 |
| Machine Shop Turnings | 14.25 to 14.50 |
| Cast Borings | 9.00 to 9.50 |
| Mixed Borings, &c | 10.50 to 11.50 |
| No. 1 Boilers, cut | 14.50 to 15.00 |
| Heavy Cast Scrap | 17.00 to 17.50 |
| Stove Plate and Light Cast Scrap | 13.00 to 13.50 |
| Railroad Malleable | 16.00 to 16.50 |
| Agricultural Malleable | 15.00 to 15.50 |

**Metals.**—Copper has continued to display considerable strength in the face of unfavorable reports from primary markets. While there is not much business, there is an improved inquiry with some important business pending. Casting Copper is difficult to obtain in this market under 14¾c., and Lake is held at 15c. in carload lots. Pig Lead has remained nominal. The labor difficulties at the mines are said to have been adjusted, and the outlook is now more favorable for future shipments. The nominal quotations continue 4.30c. in 50 to 100 ton lots and 4.32½c. to 4.35c. in carload lots. Spelter has continued in fair demand and firm, with sales on the basis of 5.40c. to 5.45c. in carload lots for Slabs. Sheet Zinc has remained strong, with a good demand at 6.90c., Chicago, in jobbing lots. Old Metals have been weaker, with prices of Brass, Copper Bottoms and Lead Pipe lower, and only a moderate demand at the decline. Heavy Cut Copper is held at 12½c., Red Brass at 12¼c., Copper Bottoms at 11c., Lead Pipe at 4c. and Zinc at 4.25c., spot

**Coke.**—The market has remained easy under free offerings and only a moderate demand, shipments on contracts being liberal, leaving little necessity for furnaces to purchase in the open market. Furnace Coke is offered at $3.50 to $4 and Foundry Coke at $4.50 to $5, at the ovens, freight to Chicago being $2.65. Moderate sales have been made at $6 to $7.25 per ton, spot track, Chicago, according to quality and situation

## Philadelphia.

FORREST BUILDING, May 12, 1903.

The Iron situation is beginning to assume a more definite character than it has for months past, and it is reasonably clear that the ultimate outcome will be a general readjustment of prices. There is nothing in the situation to cause uneasiness, neither is there anything to indicate that there is any decrease in the volume of business, but the productive capacity has pretty well reached the utmost requirements. The natural result, therefore, is to not only give a complete check to advancing prices, but to a readjustment on a basis which will prevent further importations. How much will be required to accomplish this is a matter of some uncertainty, but a beginning has been made with a reduction on last week's prices of about $1 a ton on Foundry Iron, and also some reduction on Finished Material. There is not much margin on the last named, but it may perhaps be secured on cheaper raw materials. Coal and Coke are considerably lower, and even at $20 for Pig Iron makers can do a great deal better than they did last year, when $23 and upward was paid for Pig Iron. The mere fact of lower prices for Pig Iron is therefore perfectly consistent with sound conditions, and, in fact, confidence will be much stronger when prices reach an average of what they usually are under normal conditions. The Finished Material end of the Iron and Steel business is less satisfactory than that in Pig Iron. Prices have at no time been in proportion with raw materials, yet the decline is relatively greater in finished than in raw material. This is one of the anomalies which is difficult to explain, but the problem will have to be worked out during the next few weeks. The feeling at the moment is therefore one of considerable uncertainty, both as regards price and demand, but if there is no serious trouble in regard to wages there will probably be plenty of business, although it may be at a lower range of prices than was expected. The present difficulty with labor appears to be confined to the building trades, but is not regarded as likely to extend, although sympathetic strikes are threatened.

**Pig Iron.**—Without any concerted movement among producers, a decline of about $1 per ton has been conceded during the past few days. There is, as there always is in a market of this kind, a wide discrepancy in quotations, varying according to the circumstances in each particular case. Sometimes it is a case of meeting competition, in others it may be an inordinate desire to get a good line of business on the books, but it does not appear that the time has come when immediate sales are a financial necessity. Stocks may be increasing a little, but there is nothing burdensome, and in that respect conditions are perfectly healthy. It does seem, however, that consumers are in some cases carrying more Iron than was supposed, and for that reason deliveries are taken less freely than for a long time past. This is not a satisfactory feature, but it is by no means a new discovery. When the market is advancing consumers can never get enough material into their yards, while on a decline they always claim to be overstocked. It may be, however, a case of cause and effect rather than a coincidence, but whichever it may be, requests for a postponement of shipments have of late been unpleasantly frequent. The result is that prices are lower. A fair average at this time for No. 2 X Foundry would be about $20.50 to $20.75. Some might want a trifle more for a special quality, some might shade the inside quotation; all depends on circumstances. There is no uniformity, however; every seller makes his own price and uses his own judgment in regard to meeting the market. New business is not important and for the present buyers show no disposition to do more than cover their early requirements. The weak-

ness at present is more pronounced in Foundry grades than in mill Irons, although the latter will no doubt be more or less affected in due course. For the present a fair average of prices for Philadelphia and nearby territory would be about as follows for deliveries in buyers' yards:

| | |
|---|---|
| No. 1 X Foundry | $21.00 to $21.50 |
| No. 2 X Foundry | 20.25 to 20.75 |
| No. 2 Plain | 19.50 to 20.00 |
| Gray Forge | 18.50 to 19.50 |
| Basic | 19.25 to 19.75 |
| Middlesbrough, No. 3 | 19.50 to 20.00 |

Cargo lots c.i.f.

| | |
|---|---|
| Low Phosphorus, 0.035 | $21.00 to $21.25 |
| Bessemer | 20.00 to 20.50 |
| Middlesbrough, No. 3 | 17.50 to 18.00 |

**Steel.**—The market for Steel is very unsettled and for fall deliveries prices would have to be considerably lower to secure desirable business. Spot Steel is scarce and prices are firm, but no large lots would be taken unless at materially lower figures. Quotations under such circumstances are more or less uncertain, but foreign could be done at $28 to $28.50, on dock, duty paid, and domestic at $30.50 to $32, according to date for delivery.

**Plates.**—There is no material change from the conditions noted in our last report. There is a good deal of business coming in, and for the present mills are fully employed, but with the enormous capacity which is now in operation it requires a large tonnage to keep them all employed. Prices are fairly steady, but on large orders for extended deliveries rates are made to correspond with those at other points. Ordinary quotations are about as follows for the usual run of business: Small lots, 1.95c. to 2c.; carload lots, ¼-inch and thicker, 1.80c. to 1.85c.; Universals, 1.80c.; Flange, 2c.; Marine, 2.10c. to 2.15c.; Fire Box, 2.20c. to 2.25c.

**Structural Material.**—The market is a little quiet, owing to trouble in the building trades, although there is nothing that is likely to affect prices, for the present at all events. Prompt deliveries can be had, however, and while orders on the books are very large, it is hardly likely that there will be any such trouble to get deliveries as there was last summer. Prices unchanged as follows: Beams, Angles or Channels, ordinary sizes, 1.73½c. to 1.78½c. for carload lots, with the usual addition for smaller quantities.

**Bars.**—The Bar Iron situation is considerably unsettled at the present time. Meetings have been held by the Eastern Bar Iron Association, but no satisfactory agreement could be reached, so that practically the mills are free to make their own prices. This no doubt will bring in a good deal of business, which has been in abeyance in anticipation of something of this kind to happen, but what prices will be quoted remains to be seen. It is thought 1.85c., delivered, will be a bottom figure for Refined Iron in carload lots, but it is hard to say what competition will do in a market of this kind. Nominal prices are about 1.85c. to 1.90c., delivered, for Refined Iron, and 1.75c. to 1.80c. for Steel Bars.

**Sheets.**—There is a good demand for Sheets and prices are well maintained, considering the unsettled condition of other specialties. The demand for Sheets, however, appears to equal the fullest output, consequently there is less difficulty in regard to prices than in other departments.

**Old Material.**—The market is irregular and uncertain and hard to quote with exactness. Steel Scrap is scarce and firm at unchanged prices, but Rolling Mill Scrap is extremely dull. Mills are said to be carrying very little stock, and if there should be a midsummer spurt in the demand for Muck Bars or Bar Iron, holders of Scrap have an idea that they will be able to get more money. For the present, however, bids are at reduced figures, but consumers may not be able to place their orders unless at more or less of a compromise between bids and offers, which are about as follows for deliveries in buyers' yards:

| | |
|---|---|
| Old Steel Rails | $21.50 to $22.00 |
| Heavy Steel Scrap | 20.50 to 21.25 |
| Low Phosphorus Scrap | 28.00 to 29.00 |
| Old Steel Axles | 26.00 to 27.00 |
| Old Iron Rails | 24.50 to 25.00 |
| Old Iron Axles | 29.00 to 30.00 |
| Old Car Wheels | 24.00 to 25.00 |
| Choice Scrap, R. R. No. 1 Wrought | 22.50 to 23.50 |
| Country Scrap | 19.50 to 20.00 |
| Machinery Scrap | 19.50 to 20.00 |
| No. 2 Light Scrap | 18.00 to 19.00 |
| No. 2 Light (Ordinary) | 14.00 to 15.00 |
| Wrought Turnings | 15.50 to 16.00 |
| Wrought Turnings, Choice Heavy | 17.00 to 17.50 |
| Cast Borings | 11.00 to 11.50 |
| Stove Plate | 15.00 to 15.50 |

William Dette & Co., Pennsylvania Building, Philadelphia, have been appointed exclusive agents for the sale of the Lehigh Steel & Iron Company's Pig Iron in this and adjacent territory.

The negotiations between the Crucible Steel Company of America and the Colonial Steel Company for the purchase of the plant of the latter by the former company are still pending.

## St. Louis.

CHEMICAL BUILDING, May 13, 1903.—(*By Telegraph.*)

**Pig Iron.**—The market shows but little life, and the extent of the buying does not go beyond some sales for quick delivery of the 50 and 100 ton variety. The majority of the business is executed on a price basis of from $16.50 to $17.50, Birmingham, for No. 2 Foundry, but some stray lots we have heard of changing hands slightly under the low figures. Buyers continue to show little disposition to come into the market, and if current gossip can be credited, it is unlikely that any pronounced movement will be forthcoming before July 1 or thereabouts. Deliveries of contract Iron have shown a decided improvement the past few weeks, and very little complaint is said to be heard on this score. We quote, f.o.b. St. Louis, as follows:

| | |
|---|---|
| Southern, No. 1 Foundry | $20.75 to $21.75 |
| Southern, No. 2 Foundry | 20.25 to 21.25 |
| Southern, No. 3 Foundry | 19.75 to 20.75 |
| Southern, No. 4 Foundry | 19.25 to 20.25 |
| No. 1 Soft | 20.75 to 21.75 |
| No. 2 Soft | 20.25 to 21.25 |
| Gray Forge | 18.75 to 19.75 |
| Southern Car Wheel | 28.50 to 28.75 |
| Malleable Bessemer | 25.00 to 25.75 |
| Ohio Silvery, 8 per cent. Silicon | 32.50 to 33.00 |
| Ohio Strong Softeners, No. 1 | .... to .... |
| Ohio Strong Softeners, No. 2 | .... to .... |

**Bars.**—The movement of Iron and Steel Bars the past week has been in very fair volume, with the Steel commanding the larger amount of consideration. Jobbers report trade conditions as being quite satisfactory, and in the matter of quotations no changes are to be reported. We quote from the mills: Iron Bars at 1.85c. to 1.90c.; Steel Bars at 1.82½c. to 1.90c., half extras. Jobbers quote for both Iron and Steel, 2.15c. in large lots and an advance of 10c. over this figure for small requirements.

**Rails and Track Supplies.**—Little if any change is heard in the conditions governing this department of the market. The pronounced and urgent demand continues, and the point of delivery is the important and difficult stipulation to decide and live up to. We quote as follows: Splice Bars at 2.05c. to 2.25c.; Bolts, with Hexagon Nuts, 3.05c. to 3.25c.; with Square Nuts, 2.90c. to 3.05c.; Spikes, 2.25c. to 2.30c. Jobbers' prices are generally about 10c. to 15c. higher than the above quotations.

**Angles and Channels.**—A very steady demand for Small Angles and Channels continues to come to the jobbing trade, and price conditions are unchanged. In lots from store for materials of this class, 2.25c. to 2.40c. is quoted.

**Spelter.**—The Spelter market, while quiet, preserves a very firm undertone, and prices have shown no disposition to fall. Immediate shipments command 5.50c., while for far off deliveries, 5.40c. is asked.

## Pittsburgh.

(*By Telegraph.*)

PARK BUILDING, May 13, 1903.

**Pig Iron.**—The Pig Iron market has held fairly steady in the past week, and a fair amount of Iron has changed hands. Reports are being circulated that there is a surplus of Iron, and these have probably been started with a view of depressing the market. The facts are that all of the large Steel companies have been more or less short of metal right along, and the output of the furnaces is being consumed about as fast as turned out. While it is true that prices have given way to some extent, this is due to the fact that the market on Pig Iron was relatively high, due to a restricted output on account of the scarcity of Coke. The fact that there is now a plentiful supply of Coke has, of course, materially increased the output of Pig Iron, but there is no surplus, as claimed by certain interests that have been trying to bear the market. Bessemer Pig Iron for shipment over last six months is held at $19, at Valley furnace, and reports of sales having been made at prices materially under this figure are not verified. For shipment over June, July and August Bessemer Iron is held at $19.25 to $19.40, at Valley furnace. Sales of Bessemer Iron in April were above 60,000 tons, prices averaging for the month close to $20, at Valley furnace. There is a fair movement in Forge Iron, Northern brands being held at about $20, Pittsburgh; but on a fair offer this price would be shaded. Southern Forge, the official price of which is $19.85, Pittsburgh, is being offered at a lower price. Foundry Iron is somewhat quiet, buyers holding off placing contracts in the expectation that prices will be lower.

**Steel.**—An absurd report was telegraphed East from Pittsburgh yesterday that a leading Steel interest had made a heavy cut in price of Steel Billets. There was no foundation whatever for this report, the Steel market being firm, and an actual scarcity exists in supply. This is shown by the fact that Carnegie Steel Company recently turned the Ohio Works, at Youngstown, on Billets, Sheet and Tin Bars in order to give their finishing mills an increased supply of Steel, which they badly needed. Bessemer Billets are held firmly at $30.50, and Open Hearth $30.50 to $31, maker's mill.

*(By Mail.)*

A somewhat better feeling in the Iron trade has developed in the past week, and buying is more liberal, especially on lines which have been somewhat dull for a month or more. There is no doubt but that the continued cold and wet weather which we had up until ten days or two weeks ago materially interfered with the demand, and caused the lull in business so noticeable for the past month or so. However, with the return of favorable weather conditions the volume of business has extended, and is larger now than for some time. Sales of Pig Iron, while confined mostly to small lots, are more numerous, and the tone of the market is perceptibly firmer. It is not believed, however, that there will be any heavy buying of Pig Iron until prices have settled down to a point where consumers believe it is safe to enter the market. The situation in Steel is unchanged, demand being heavier than supply and prices very firm. Bessemer Billets continue to be held at about $30.50 to $31, makers' mill, and sales of fair sized lots are being made at these prices right along. The supply of Steel will be larger in a short time, the Ohio Works at Youngstown turning out 1500 tons a day or more of Billets and Bars, while a leading Pittsburgh interest are, we understand, offering a limited amount of Steel in the open market. In Finished Material the situation is satisfactory, and it is a notable fact that, in spite of the lull in demand for the past month, prices have held up firmly. In Structural Steel some good sized contracts are being placed, while the demand for Plates is beyond the ability of the mills to furnish promptly. The mills rolling Pipe and Tubes are extremely busy, and have a large tonnage on their books. The Wire and Wire Nail trades are active, and prices are being very firmly held. While the demand is probably not as heavy as in the earlier part of the year, yet the whole situation in the Iron trade is generally satisfactory, and the outlook is that tonnage this year will be very satisfactory

**Plates.**—Tonnage in Plates continues large and the mills have all the business they can handle, some of the larger interests not booking orders for delivery within two or three months from time of placing contracts. The Standard Oil Company have been in the market recently for 8000 to 10,000 tons, most of which has been placed. These orders are very desirable sizes to roll. In some cases slight premiums continue to be paid for Plates for prompt delivery, but the bulk of the business is now being placed at official prices, which are as follows: Tank Plate, ¼-inch thick and up to 100 inches in width, 1.60c., at mill, Pittsburgh; Flange and Boiler Steel, 1.70c.; Marine, Ordinary Fire Box, American Boiler Manufacturers' Association specifications, 1.80c.; Still Bottom Steel, 1.90c.; Locomotive Fire Box, not less than 2.10c., and it ranges in price up to 3c. Plates more than 100 inches wide, 5c. extra per 100 lbs. Plates 3-16 inch in thickness, $2 extra; gauges Nos. 7 and 8, $3 extra; No. 9, $5 extra. These quotations are based on carload lots, with 5c. extra for less than carload lots; terms net cash in 30 days.

**Structural Material.**—Inquiries continue heavy and tonnage so far this month has been fully as large as in May, 1902, which was the heaviest month ever known in the Structural trade. Among recent contracts placed was the material for the Oliver Building in this city, about 2000 tons, taken by American Bridge Company. Bids have been asked for a Steel Bridge at Bellaire, which will require about 3500 tons. There is still some delay in getting prompt deliveries of Structural Steel and the leading interest is filled up for the next two months or longer. There is no change in prices, which are as follows: Beams and Channels up to 15-inch, 1.60c.; over 15-inch, 1.70c.; Angles, 3 x 2 up to 6 x 6, 1.60c.; Zees, 1.60c.; Tees, 1.60c.; Steel Bars, 1.60c., half extras, at mill; Universal and Sheared Plates, 1.60c. to 1.70c.

**Steel Rails.**—The Rail mills are sold up practically for the balance of the year, and only small orders are being placed. The Baltimore & Ohio and Pennsylvania railroads have recently placed fair sized orders for Nickel Steel Rails, the wearing qualities of which are said to be very much better than Rails rolled from Bessemer Steel. These Rails of course command a higher price. We quote at $28, at mill, for Standard Sections, in 500-ton lots and over.

**Spikes.**—We continue to quote Railroad and Boat Spikes at $2.25 per 100 lbs., f.o.b. Pittsburgh. It is intimated that in special cases these prices have been slightly shaded.

**Sheets.**—Demand for Sheets is not quite as large as a month ago, but most of the mills, notably those of the leading interest, are well filled up for the next six weeks to two months. Differentials in Sheets have recently been advanced in a number of sizes, the object being to induce consumers to provide their own shears for shearing odd sizes. Prices on Sheets are very firm, but there is no intimation at this time of a general advance which was expected by the trade some time since. We quote Black Sheets as follows: Nos. 22 and 24, Box Annealed, one pass through cold rolls, 2.45c.; No. 26, 2.55c.; No. 27, 2.65c. to 2.75c., and No. 28, 2.75c. to 2.85c. We quote Galvanized Sheets at 75 and 10 off in carload and larger lots for desirable orders, but note that some mills are quoting at 75 and 7½ off. In small lots Galvanized Sheets are held at 75 and 5 off.

**Iron and Steel Bars.**—A material improvement in tonnage in Steel Bars is reported in the past week, a good many fair sized orders having been placed. Specifications on old contracts are coming in at a more satisfactory rate than for some time. Demand for Iron Bars is fair, and the tone of the market is quite firm, prices being shaded only to slight extent by a few of the outside mills. We quote Iron Bars at 1.85c., f.o.b. Pittsburgh, in carloads, and small lots at 1.90c. to 1.95c., half extras, as per National card. We quote Steel Bars at 1.60c., at mill. All specifications for less than 2000 lbs. of a size subject to the following differential extras: Quantities less than 2000 lbs., but not less than 1000 lbs., 0.10c. per lb. extra. Quantities less than 1000 lbs., 0.30c. per lb. extra, the total weight of a size to determine the extra regardless of length.

**Muck Bar.**—Demand is very dull, there being practically nothing doing. We quote domestic makes of Muck Bar at $35, Pittsburgh, but on a firm offer this might be shaded.

**Hoops and Bands.**—There is a moderate tonnage in Hoops and Bands, but the season in Cotton Ties is about over. There is no change in prices, which are as follows: Cotton Ties, 88c. in 5000-bundle lots and over, and 91c. for less quantities. Steel Hoops are 1.90c. on 200-ton lots and over, and 2c. in less quantities. Bessemer Bands are 1.60c. up to No. 12 gauge, and Open Hearth, 1.70c., extras as per Steel card. These prices are f.o.b. maker's mill.

**Rods.**—Demand for Rods is quite active, and prices are very firm. The supply is limited, and some of the outside Wire and Nail mills that buy Rods in the open market are having trouble in getting Rods as fast as needed. We quote Bessemer Rods at $37 to $37.50 and Open Hearth at $38, f.o.b. Pittsburgh.

**Merchant Steel.**—So far very few Implement makers have entered the market, but the few contracts placed from this class of buyers are fully as large as last year. It is said that on some kinds of Merchant Steel tonnage has fallen off considerably as compared with last year. The Shafting market is somewhat quiet, demand having fallen off very much in the past month or two. We quote: Tire Steel, 1.80c. to 1.90c.; Open Hearth Steel, ordinary grades, 1.70c. to 1.80c.; Open Hearth Spring, 2.25c. to 2.35c.; Cant Hook Steel, 2.75c. to 3c.; Plow Slabs, Bessemer, 2.50c.; Plow Slabs, Open Hearth, 2.75c. to 2.85c.; Tool Steel, ordinary grades, 6½c. and upward; Cold Rolled Shafting, 42 per cent. off in less than carloads, and 47 per cent. in carloads, delivered in base territory.

**Spelter.**—The market on Spelter is strong, and prices have recently advanced. We quote best grades of Prime Western Spelter at 4.58½c. for futures and 5.63½c. for prompt delivery. These prices are f.o.b. Pittsburgh.

**Pipes and Tubes.**—The Pipe market is in very satisfactory condition, the demand being large and the leading mills are well sold up for the next several months. On the larger sizes of Pipe running from 6 inches up to 20 inches the demand is enormous, and some oil and gas lines have recently been placed that will run into a very large tonnage. The tone of the market is firm, prices being well held, and in some cases slight premiums are paid for prompt deliveries. Discounts to consumers in carloads are as follows:

*Merchant Pipe.*

| | Steel. | | Wrought Iron. | |
|---|---|---|---|---|
| | Black. | Galv. | Black. | Galv. |
| | Per cent. | Per cent. | Per cent. | Per cent. |
| ⅛, ¼ and ⅜ inch | 68 | 58 | 65 | 55 |
| ½ inch | 70 | 60 | 67 | 57 |
| ¾ to 6 inches | 75 | 65 | 72 | 62 |
| 7 to 12 inches | 69 | 59 | 66 | 56 |
| Plugged and Reamed: | | | | |
| 1 to 4 inches | 73 | 63 | 70 | 60 |
| Cut 3 to 6 feet: | | | | |
| ⅛, ¼ and ⅜ inch | 63 | 52 | 60 | 49 |
| ½ inch | 65 | 54 | 62 | 51 |
| ¾ to 6 inches | 71 | 60 | 68 | 57 |
| 7 to 12 inches | 65 | 53 | 61 | 50 |
| Cut 6 feet and longer: | | | | |
| ⅛, ¼ and ⅜ inch | 64 | 53 | 61 | 50 |
| ½ inch | 66 | 55 | 63 | 52 |
| ¾ to 6 inches | 72 | 61 | 69 | 58 |
| 7 to 12 inches | 66 | 54 | 62 | 51 |
| Extra Strong Plain End: | | | | |
| ⅛ to 8 inches | 67 | 57 | 63 | 53 |
| Threads only | 66 | 56 | 62 | 52 |
| Threads and Couplings | 65 | 55 | 61 | 51 |
| Double Extra Strong Plain End: | | | | |
| ½ to 8 inches | 59 | 49 | 55 | 45 |
| Threads only | 58 | 48 | 54 | 44 |
| Threads and Couplings | 57 | 47 | 53 | 43 |

NOTE.—Orders for less than carload will be charged at 12½ per cent. advance. Extra and Double Extra Strong Cut Lengths, lower random discounts by 10 per cent. net for 6 feet and longer, and 15 per cent. net for 3 to 6 feet. We may note, however, that on Iron Pipe some of the outside mills are naming slightly lower discounts.

**Iron and Steel Scrap.**—The general market on Old Material is somewhat quiet and prices are without special change. The best demand is for Heavy Melting Stock, which seems somewhat scarce and is quoted at $21.50 to $22 in gross tons. We are advised of several sales of fair sized lots at the higher price. Low Phosphorus Melting Stock

is $24.50 to $25 in gross tons; No. 1 Cast Scrap, $18.50 to $19, net tons; No. 1 Wrought Scrap, $21 to $21.50 in net tons.

**Coke.**—There is a surplus of Coke at the present time and reports are going of Furnace Coke having been offered at extremely low prices for prompt shipment. Recently the Frick Coke Company blew out about 200 ovens, and if present conditions continue it is probable that additional ovens will be blown out to reduce output. The movement of cars is very satisfactory, but with the Coal and Ore trades opening up, this will divert a large number of cars to these trades and may possibly result in a shortage of cars for the movement of Coke, but this is hardly expected. Output in the upper and lower Connellsville region last week was slightly over 300,000 tons. No contracts for Furnace Coke are being made for shipment over last six months of the year, consumers holding off until the market settles down to a point that in their opinion will warrant them in placing contracts. Prompt Furnace Coke can be had at $3.50 a ton or lower.

## Cleveland.

CLEVELAND, OHIO, May 12, 1903.

**Iron Ore.**—The lake situation is still unsettled. The contract rates have been established, but much uncertainty still remains as to the rates that are to be charged throughout the year on going charters. It is known that the United States Steel Corporation will be practically off of the market as a wild shipper, and that the other shippers have covered more than their usual per cent. of material with contracts. In addition it is now generally believed that the total shipment from the upper lakes this year will not exceed 25,000,000 tons, a reduction of over 2,000,000 tons from the figures of a year ago. This is the computation made by some of the Ore shipping companies. With a reduction in the amount of Ore to be shipped and the quite general contracting for large percentages of the Ore to be moved, the wild market for the year does not promise very well, especially for those vessel owners who have decided to risk most of their tonnage on the wild market. The dispatch to the boats is improving, but it is evident that the trade has not resumed its usual mid-season activity. The market is, therefore, weak. The better dispatch is due to the operations of the Ore unloading machinery, one boat containing 5300 tons having been unloaded in 5 hours and 40 minutes a few days ago. The wild and contract rates remain as they have been: 85c. from Duluth, 75c. from Marquette and 65c. from Escanaba. Nothing is reported in Ore sales on which the price remains as fixed, being based on $4.50 for Bessemer Old Range and $4 for Bessemer Mesaba.

**Pig Iron.**—The market is still easy, and it might almost be said that there is no market. In fact, the little buying that is being done for May and June is the one thing that prevents stagnation in the trade. The furnaces have a very little Iron to sell for the remainder of May and June, and are disposing of it at the same prices which have prevailed for the past month or more—namely, $22, f.o.b. Southern Ohio furnace. The buying for second half is at a stand still. The possibilities for the future are indicated by the present consumption, which has continued unabated, and the demand is still equal to the supply regardless of the fact that the easing of the Coke situation has aided the production of Iron very materially. The quotations remain: For No. 2 Valley Furnace, $21 to $21.50 for second half. The Bessemer and the Basic markets have been very dull, and there has been an almost complete lack of interest in the trades. There are two conditions which contribute to this result. One is the generality of the demand for lower prices, and the other is the growing uncertainty as to the amount which will be demanded for second half consumption, the easing up in the demand for Steel making that seemingly a pertinent question. Prices are nominal. Bessemer, $21.50 to $22, Valley furnace, first half; $20.50 to $21, Valley furnace, second half; Basic, $21.50 to $22, Valley furnace, first half; $20, second half, in the Valleys.

**Finished Iron and Steel.**—There is beyond question a general easing up in the Steel trade in this territory. The situation, however, is healthy and shows no signs of material weakness. That it is more than merely temporary, however, is conceded. The return to normal conditions is being generally talked. The Structural trade is illustrative. There has been a fair demand for it all along and all of the mills are comfortably filled, but there is no longer the crying need for it that speaks of distress to projects unless orders are immediately filled. The contractors are taking things more easily and in some instances projects which have been under contemplation are postponed. The new orders to the big mills are slow and they are able to make deliveries more promptly than for a year, specifications on old contracts being slow. The prices have remained stable, with the exception that premiums are no longer talked of. They are 1.60c., Pittsburgh, from the mills and 2.15c. to 2.25c. out of stock, in which there is a fair trade. The Bar situation is satisfactory. The buying of Bar Iron has inclined to be a little heavier, but the mills have not encouraged it. However on choice orders, which can be easily rolled, the mills are inclined to shade the price very slightly. The Bar quotations are: 1.60c., Pittsburgh, for Bessemer; 1.70c., Pittsburgh, for Open Hearth, and 1.80c. to 1.85c. for Bar Iron, based on Youngstown. The Plate trade is still looking up well, with, however, some of the smaller mills reporting that they are able to make deliveries in quick time, and this is understood to be the result of the competition of some of the big neighbors, which are seeking to place a surplus. Deliveries are almost immediately possible on some sizes of Plates. The Sheet market is one of the redeeming features of the trade. The demand is good and steady, and the mills are reporting the best business in months. The market has been strong with upward tendencies, but no advances have been made or are thought possible. The prices, therefore, are based on a quotation of 3.10c. to 3.25c. for No. 27 Black Sheets out of stock and 2.85c. to 2.95c. for the same gauge at the mills.

**Old Material.**—The Scrap trade has been dull, in keeping with the state of affairs in the Pig Iron trade. There has been but little business, even in Steel Scrap, which was more freely offered. The market had a downward tendency without, however, a change in prices. We quote: No. 1 Wrought, $19.50, net; Cast Borings, $12, gross; Car Wheels, $22.50, gross; Heavy Steel, $21, gross; Iron Rails, $25.50, gross; Iron Axles, $27.50, net; Wrought Turnings, $14.50, net; Old Steel Rails, $21, gross.

## Belgian Iron Market.

BRUSSELS, April 30, 1903.

The activity in business is now sufficient to give our works normal occupation. The news from our principal competing countries, notably from Germany and from England, is considerably better, and seems to hold out the promise of a further improvement before long. Raw materials show an upward tendency, Pig Iron is worth 58 francs, Charleroi Mill Iron 60 francs for Foundry Iron and 53 francs for Athus Mill Iron. Luxemburg Irons are 51 and 55 francs, respectively, f.o.b. cars, furnace. These prices are not subject to any concessions, and in the face of this firmness the rolling mills who buy Pig Iron have covered for the greater part of their requirements until the end of the third quarter of the current year.

The Steel market is also very firm. Ingots easily fetch 86 francs, and Blooms cannot be bought under 98 francs. So far as Billets are concerned, they have been raised to 102 to 103 francs. Old Material of late develops a rising tendency. The natural result has been that Finished Iron and Steel has risen in price, but not to an extent which the rolling mills consider adequate. As a matter of a fact, a mill which must pay 98 francs for Blooms, and is forced to take orders for Merchant Steel at 120 francs for the home market, and £5 4s., f.o.b. Antwerp, cannot realize any profit. The result is that many mills are asking 135 francs for the home market, and £5 6s. for export, but cannot succeed in securing these prices. Still the numerous orders which come from foreign countries permit them generally to ask slightly higher prices than those realized a month or two ago.

The exports of Iron and Steel from Belgium to the United States figure up 25,024 tons, as compared with 1204 tons during the corresponding quarter of 1902. This includes 1900 tons of Pig Iron, 719 tons of Beams, 2090 tons of various rolled products, 14,610 tons of Rails and 1079 tons of Finished Steel. It includes also 3290 tons of Old Material.

The Société Cockerill have recently carried off an order for 25,000 tons to be delivered in five months from August to September, 1903, at £4 16s., f.o.b. Antwerp.

No. 2 Iron Bars are ordered in sufficient quantity to allow the mills to run their trains regularly. From India and from Japan specifications are coming in a little better, and the price is £5 4s. for No. 2 Bars, which is no longer disputed.

There is a good deal of work in Beams and large Shapes, the building season having begun quite generally and promising well. Heavy purchases have also been made by the Levant, the British Indies, and, above all, for Japan. It is even stated that the requirements have not yet entirely been covered. The Beam mills having orders in hand for several months are declining to quote. Very little can be done in Beams below £4 10s., but the large works are all asking £4 12s. to £4 14s.

If there is any branch of the Iron industry which does not seem to participate in this movement, it is that of Plates and Sheets, in spite of the fact affairs are progressing better in Germany and in England. Until now the prices which the mills have been able to secure for exports are hardly sufficient to cover cost of production. For the home market the prices are 145 francs for Iron and 147.50 francs for Basic Steel Plates. The quotation is 160 francs for Open Hearth Plates. For export Iron Plates are worth £5 13s. and Steel Plates £5 17s.

Iron Wire Rods are still maintained at 145 francs, f.o.b.

Antwerp, while Steel Rods are quoted 150 francs. In Wire Nails business is very satisfactory. An understanding has been reached between the Belgian syndicates and the German syndicates, the latter controlling the entire Belgian production for export. The inquiries for England, the Orient, British Indies and Australia must now be addressed not to the producing works, but to a representative of the German Wire Syndicate resident in Belgium, and it is he who designates the works at which the orders are to be carried out.

For the first quarter our exports have been 185,031 metric tons, as compared with 163,866 tons in 1902. The increase has been particularly large in Rails from 33,191 to 55,733 tons, and in Beams from 6199 to 11,148 tons. The imports have risen from 159,676 tons to 172,515.

The bridge shops and car shops are very well occupied. The Belgian Government has ordered a good number of cars which will permit them to work steadily. The boilermakers still complain of scarcity of orders and of low prices. The Chain works are doing better latterly. The Bolt factories have a good deal of work for the home market, but the competition between the works is very sharp and prices are very low. It would be very desirable if Belgium, which is an industrial country, were to take resolutely hold of the formation of large selling agencies and cease to be the scene not only of the competition between the producers themselves, but also of foreign makers. All the leading Iron industries ought to be syndicated, and then they would probably secure larger profits. Unfortunately our country, like England, is obstinate in maintaining the old course, while Germany, France and the United States have their syndicates and their selling associations and their trusts.

## Cincinnati.

FIFTH AND MAIN STS., May 13, 1903.—(*By Telegraph.*)

The general aspect of the Pig Iron market seems to have changed very slightly during the past week. There is a remarkably small tonnage of Foundry and Mill Iron reported as sold. This is made up almost entirely of retail business, and it is an exception where a sale reaches the quantity of 100 tons. There are a few inquiries for as much as 1000 tons, but so far no seller has openly offered to take less than the $16, Birmingham, basis for No. 2 Foundry and buyers are backward in naming the price at which they are willing to take hold. Some authorities claim that they have pretty good evidence that Gray Forge has been offered in round lots the last half delivery on the basis of $14, Birmingham, with no trade resulting. There is undoubtedly some little Southern Iron selling on the basis of $16.25 to $16.50 for No. 2, but this is all for prompt shipment, and usually of brands which the buyers needed in mixtures. Reports regarding Bessemer Pig show that there is a fair demand for it, and at a range of about $1 per ton, Valley furnaces, between high and low sales. The Coke situation is more nearly normal than it has been for the better part of the year. The outlook is for another quiet week, and sufficient unto the day in the matter of prophecy is the evil thereof. Freight rates from the Hanging Rock district, $1.15, and from Birmingham to Ohio River points $3.25. We quote, f.o.b. Cincinnati, for delivery throughout the year, as follows:

| | |
|---|---|
| Southern Coke, No. 1 | $19.75 to $21.25 |
| Southern Coke, No. 2 | 19.25 to 20.75 |
| Southern Coke, No. 3 | 18.75 to 20.25 |
| Southern Coke, No. 4 | 17.75 to 19.75 |
| Southern Coke, No. 1 Soft | 19.75 to 21.25 |
| Southern Coke, No. 2 Soft | 19.25 to 20.75 |
| Southern Coke, Gray Forge | 17.00 to 19.50 |
| Southern Coke, Mottled | 17.00 to 19.50 |
| Ohio Silvery, No. 1 | 26.15 to 27.15 |
| Lake Superior Coke, No. 1 | 22.15 to 23.15 |
| Lake Superior Coke, No. 2 | 21.15 to 22.15 |
| Lake Superior Coke, No. 3 | 20.15 to 21.15 |
| *Car Wheel and Malleable Irons.* | |
| Standard Southern Car Wheel | $28.25 to $29.25 |
| Lake Superior Car Wheel and Malleable | 27.50 to 28.50 |

**Plates and Bars.**—We quote, f.o.b. Cincinnati, as follows: Iron Bars in carload lots, 1.92c., with half extras; same, in small lots, 2.20c., with full extras; Steel Bars, carload lots, 1.73c., with half extras; same, in small lots, 2.20c., with full extras; Plates, ¼-inch, in carload lots, are still nominally 1.70c.; 3-16 inch, 1.80c.; Beams and Channels, 1.70c., base.

## Birmingham.

BIRMINGHAM, ALA., May 11, 1903.

It is a hard matter to diagnose the Iron market. Each side has arguments convincing as to the outcome depending upon the conclusions of the immortal "J. N." as to which view you take of it. There are some interests, and they are important and influential, that are allied in maintaining the association prices. There are other interests that pay no attention whatever to association prices, but whack away at whatever prices offer. These latter are constituted as outside furnaces and their influence depends upon considerations not always to be represented in print. Consequently it is always a hard matter to properly represent this element in actual transactions. The association prices, which are on a basis of $17.50 for No. 2 Foundry, are being maintained as far as practicable, and this suggests that where the prices demanded are not acceded to what can be worked is accepted. The result is clearly manifest. The buyers have the market.

The major part of the trade was for nearby delivery and prices were in the majority of instances shaded. But these were trades at what is called association prices. They were in some instances cut, but it is hard to give the particulars. There are two elements of the trade with which to deal, each of which has claims for consideration, and it makes it difficult to quote correctly. There were sales of No. 2 Foundry on the basis of $17 for No. 2 Foundry, prompt and nearby delivery, and there were sales of the same grade at 50c. less per ton. Sales of Mottled have been reported at $15.25 to $15.50, and Gray Forge at the same price, $15.50. The amount of the transactions actually concluded and the number of them have been restricted. The inquiry has been very fair. As a rule the association furnaces are maintaining schedule prices where practicable, but instances will occur where concessions are necessary to meet competition and rumors are rife in regard to them. There was one sale reported of 10,000 tons, covering the popular grades, at association prices, and running as to delivery into the third quarter of the year. On such a market rumors are rife and one can hear of all kinds of prices which it is simply impossible to verify. Those who are cutting prices are not publishing the fact.

Rumors are free concerning the establishment of a new furnace plant by Pennsylvania parties, and there is foundation for them. But whether the plant is to be a single stack, or of greater magnitude, has not yet developed. All one can say is that the matter is under consideration by the parties interested.

A Steel plant is being agitated and considered, to be devoted to structural material. There is great activity in all lines and an active inquiry for Ore and Coal lands, which for results are put to the test of the drill.

## New York.

NEW YORK, May 13, 1903.

**Pig Iron.**—The market is very dull and is weak. Transactions are on a very moderate scale and every one is the result of prolonged negotiations, in which concessions are made. No importations of foreign Foundry Iron have been arranged for for a month past, and what Iron is coming forward is on old transactions. We quote, for delivery at New York and tidewater: Northern No. 1, $20.75 to $21; No. 2 Foundry, $19.75 to $20.25; No. 2 Plain, $19.25 to $19.50. Tennessee and Alabama brands, No. 1 Foundry, $20.75 to $21.25; No. 2, $20.25 to $20.75, and No. 3 Foundry, $19.75 to $20.25.

**Cast Iron Pipe.**—The demand for small lots continues active, and the Northern shops are well filled into the summer. Holyoke, Mas., has just closed for about 600 tons and New York is in the market for about 700 tons. Prices in carload lots continue at $36.50, per gross ton, at tidewater, for 6 and 8 inch, and $35.50 for 12-inch and upward.

**Steel Rails.**—Business is light and prices remain at $28 for Standard Sections at Eastern mill.

**Finished Iron and Steel.**—The local market for Structural Steel continues quite active. During the last two weeks one of the local contractors has taken from 6000 to 7000 tons. Figuring is going on on the large building on the site of the Sturtevant House, and the Trinity Building contract will probably be also closed at an early date. The local labor situation has taken another turn. The American Bridge Company succeeded in making terms with one set of hoisting engineers, and are now advised by the Central body that it happens to be the wrong union of hoisting engineers. The old Bar Iron Association has been disbanded by the withdrawal of a very important interest in Central Pennsylvania. The rump has entered into another gentleman's agreement. We quote, at tidewater, as follows: Beams, Channels and Zees, 1.75c. to 2c.; Angles, 1.75c. to 2c.; Tees, 1.80c. to 2c.; Bulb Angles and Deck Beams, 1.90c. to 2.25c. Sheared Steel Plates, in carload lots, are 1.90c. to 2c. for Tank, 2c. to 2.10c. for Flange, 2.10c. to 2.20c. for Marine and 2.35c. upward for Fire Box. Refined Bars are 1.85c. to 2c.; Soft Steel Bars, 1.75c. to 1.90c.

**Old Material.**—There is a fair demand for Steel Melting Stock, which is firm. One lot of about 4000 tons was sold, at private terms, to a Steel Works, for delivery during the balance of the year. Casting Scrap and Wrought Scrap are weaker. Relaying Rails are still scarce, and are firmly held. We quote, f.o.b. cars vicinity New York, per gross ton, as follows:

| | |
|---|---|
| Old Iron Rails | $24.50 to $25.00 |
| Old Steel Rails, long lengths | 22.00 to 22.25 |
| Old Steel Rails, short pieces | 19.25 to 19.50 |
| Relaying Rails, heavy sections | 27.00 to 28.00 |
| Relaying Rails, lighter sections | 29.00 to 30.00 |
| Old Car Wheels | 21.00 to 22.00 |
| Old Iron Axles | 30.00 to 30.50 |

| | |
|---|---|
| Old Steel Car Axles | 25.50 to 26.50 |
| Heavy Melting Steel Scrap | 19.25 to 19.50 |
| No. 1 Railroad Wrought Scrap Iron | 22.00 to 22.50 |
| Iron Track Scrap | 19.50 to 20.50 |
| Wrought Pipe | 15.50 to 16.00 |
| Ordinary Light Iron | 11.00 to 12.00 |
| No. 1 Machinery Cast Scrap | 17.75 to 19.00 |

## Metal Market.

NEW YORK, May 13, 1903.

**Pig Tin.**—Conditions in the Tin market are without change. Business is dull, the volume of transactions during the week having been very light. The demand from the interior continues to be slight, as consumers still seem to be getting large shipments of the metal which they purchased at lower prices. Prices have steadily declined both here and abroad. In connection with the London decline it is reported that the weakness emanates from the Far East where there are many free sellers. The quotations to-day for Spot to June range from 29.65c. to 29.75c. The closing London quotations to-day are £134 15s. for spot and £134 2s. 6d. for futures.

**Copper.**—The market was extremely dull without a new feature. The producers' prices are unchanged, but further reductions have been made by brokers selling outside lots. Lake and Electrolytic are quoted by producers 14.75c. to 15c., and Casting they quote at 14.50 to 14.75c. Outside lots are sold at from 14.50c. to 14.75c. for Lake and Electrolytic and 14.25 for Casting. The London market shows an advance over last week quoting at the close to-day £63 2s. 6d. for spot and £63 futures. Best Selected is quoted £67 15s.

**Pig Lead.**—The market is unchanged with official quotations at 4.37½c. for carload lots of Desilverized, New York delivery. London declined a shade to £11 18s. 9d.

**Spelter.**—With the exception of a slight decline in London the market is absolutely without change. Spot is quoted here 5.75c., and St. Louis quotes 5.50c. The London quotation at the close to-day is £21 7s. 6d.

**Antimony.**—We quote Cookson's at 7¾c.; Hallett, 7c., and other brands at 6⅝c. The market is weak.

**Nickel.**—We continue to quote 40c. to 45c. for large quantities and 50c. to 60c. for small lots.

**Quicksilver.**—The market is $47.50 for flasks of 76½ lbs.

**Tin Plate.**—The situation contains nothing new. No settlement has been arrived at yet regarding next year's wage scale. Production is being rushed in anticipation of the coming season. The official quotation continues at $3.80 for box of 14 x 20 100-lb. Cokes, f.o.b. mill, which is equivalent to $3.99, New York.

## The New York Machinery Market.

NEW YORK, May 13, 1903.

In all quarters of the trade the most absorbing topic of comment is the labor situation. Considerable apprehension was exhibited last month over the turn affairs might take this month. Thus far the trade has felt comparatively little disturbance, and there are no longer fears of a general outbreak among machinists. That the conditions now existing in this respect are very gratifying to the trade is to put it very mildly. The number of shops affected by strikes at the moment is really small, and no greater than ever at this time of the year when the building trades exhale germs of disturbance which naturally infect other branches of trade and industry. There is a little fear that trouble may arise in some shops on May 20. It will be recalled that in certain shops agreements were made two years ago to take effect May 20, the date of the outbreak of 1901. Last year these were renewed, and when the time comes for considering the schedule this year the machinists may demand more than they are getting under the agreements of two years ago. In New York City and the metropolitan district there may be some trouble early in June. As reported elsewhere in this issue, the machinists in the marine shops are demanding an increase for June 1. The singling out of this class of establishments is view as a test case, for, if a favorable settlement is made with the marine machinists, all others in the district will doubtless claim a like arrangement.

As for business conditions no murmur is to be heard anywhere. "Things are better than we could have hoped for in view of the labor atmosphere," is the expression often heard. Several good big deals are on hand, and several large orders were placed during the week.

In another column we give details of the plans of the new Loomis-Pettibone Gas Machinery Company in connection with their large new plant. The machinery list was sent out on Monday last. It is estimated that the purchases of equipment will amount to $500,000.

The revised Delaware, Lackawanna & Western Railroad list is now in the hands of machine tool merchants. It is somewhat smaller than expected, amounting only to about $40,000. The original list, which underwent revision, it will be recalled, included some $60,000 worth of machine tools. Owing to the scope of the shops, however, it is thought in the trade that another list will be issued in the near future in connection with the equipment of the Keyser Valley shops. Contracts for the buildings have just been placed. The shops will cover about 25 acres of ground and cost $750,000. The new buildings will include: There will be two freight car repair shops, each of which is designed 150 x 400 feet in dimensions. One mill building, 90 x 400 feet, where the materials will be manufactured for use in repairs. One blacksmith shop, 80 x 300 feet, with an L addition, 80 x 180 feet, for a machine shop. One paint shop, 60 x 400 feet. One power house, 50 x 160 feet, including the boiler house. One storehouse, 44 x 105 feet, with rooms set off for offices. And ten other buildings of small sizes. The buildings will be equipped with the most modern machinery, operated by electric power. Superintendent Hixson expects that the construction will be completed before cold weather, the machinery put in during the winter, and the shops ready for operation next spring. All the repair work on freight and coal cars along the entire Lackawanna system will be constructed at the Keyser Valley shops. They will turn out every piece of material used in making a car, and will build a new car now and then, but the work will be confined chiefly to repairs.

The New York Central Railroad are in the market for about $60,000 worth of machinery for their Oak Grove shops. They have purchased about $35,000 worth of machine tools for their new West Albany shops, and have placed the crane order with the Niles-Bement-Pond Company. Two 60-ton electric travelers were ordered.

An Advisory Committee of experts have been appointed by A. J. Cassatt, president of the Pennsylvania Railroad Company, to decide upon the purchases and equipment and assist in the construction of the New York tunnel. The appointees, with the exception of W. H. Baldwin, president of the Long Island Railroad Company, are all connected with the Pennsylvania Railroad, and are Theodore N. Ely, chief of motor power, chairman; S. D. Newhall, purchasing agent; A. W. Gibbs, general superintendent of motive power, and A. S. Vogt, chief mechanical engineer.

The following awards have been made for supplies for the Boston Navy Yard, bids for which were opened April 14:

Class 13, shafting, $2129.94; class 20, milling machine, $540; class 35, copper pipe bender, $1045; class 41, hydraulic beam bending machine, $945; Niles Tool Works Company, Hamilton, Ohio.

Class 17, engine lathe, $605; class 18, tool makers' lathe, $1196; class 19, turret lathe, $457; class 21, taper reamer and cutter grinder, $110; class 24, bench lathe, $243; class 25, turret lathe, $673; class 26, engine lathe, $407; class 39, milling machine, $975; Pratt & Whitney Company, Hartford, Conn.

Class 27, planer, $398; class 33, shaping machine, $3575; class 34, cold sawing machine, $1024; Prentiss Tool & Supply Company, New York.

Class 16, drills, $90; class 22, centering machine, $115; class 31, steam drop hammer, $1825; Manning, Maxwell & Moore, New York.

Class 4, electric motor, $510; class 29, drill grinder, $749.50; Holtzer-Cabot Electric Company, Boston, Mass.

Class 14, tools, $3936.95; Montgomery & Co., New York.

Class 15, shaper, $500; class 38, planer, $3498.60; Mark-Flather Planer Company, Nashua, N. H.

Class 28, hand milling machine, $160; class 37, screw cutting engine lathe, $680; Hill, Clarke & Co., Boston, Mass.

Class 32, heating plant, $14,898; Evans, Almiral & Co., New York.

Class 30, furnace, $6875; Rockwell Engineering Company, New York.

Class 36, splitting shear, $1122; Drew Machinery Agency, Manchester, N. H.

Class 23, cutter and reamer grinder; no award made.

Class 40, hammer core machine; will be bought in open market.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until May 26 to furnish at the Eastern Navy Yards, a number of motors, brass furnaces, traveling crane, machine tools, engine, sabining plant and saw mill outfit.

The Bullock Electric Company of Cincinnati, Ohio, are going to erect a large plant in Canada, at Montreal. George Bullock has for some time been considering the advisability of organizing a Canadian company for the purpose of erecting a large plant at Montreal. He has now completed this organization, with a capital of $1,000,000, of which one-half will be common and one-half preferred stock. George Bullock will be president of the new company and will hold a majority of the common stock. He will have as his business associates prominent citizens of Montreal. The new company will take over the Ampre Electric Mfg. Company. This plant will be enlarged and modernized. For the present several jobs will be sent on to Montreal in an unfinished state, but later the new company will take orders in Canada and the Cincinanti concern will withdraw from that territory. A number of the expert men from the Cincinnati

plant will be sent to Montreal at an early date to place the Canadian plant on a modern footing.

Kane & Roach, Syracuse, N. Y., are to build extensive additions to their plant, including a large machine shop to assist in getting out rolling mill equipments. The firm have been cramped for room for a long time, the demand for machinery being greatly in excess of their capacity.

The Lunkenheimer Company, Cincinnati, report that on account of the unprecedented demand for their superior line of brass and iron steam specialties, they have been compelled to increase their foundry output 50 per cent. Machine tools of the most improved type are being installed in various departments as fast as they can be obtained.

The Newton Machine Tool Works of Philadelphia are doubling the capacity of their shops by building an extension, 100 x 200 feet, and of practically the same general design as the present building. The structure is divided lengthwise into three bays, each 33 feet wide. The north bay is traversed by a 10-ton crane, the center by three cranes, two of 15 tons capacity each, and one of 30 tons. The central portion of the building will be used as an erecting shop. The south bay is provided with a gallery in which small tools will be placed. The building is of the usual masonry and steel frame construction, ample light being provided in the walls and by large skylights.

The Philadelphia Foundry & Machine Company, Philadelphia, Pa., have placed no contracts as yet for the equipment for their new foundry. They require an electric traveling crane shafting, some additional equipment for other departments and possibly some electrical machinery and fixtures.

The Bateman Mfg. Company, Grenloch, N. J., manufacturers of Iron Age agricultural implements, are erecting a new foundry, which will be used for the manufacture of gray iron castings. Most of the equipment has been contracted for. They are, however, now in the market for a number of molding machines.

The Motor Engine Company, 15 William street, New York, who were recently organized, have purchased a plant at Mariners' Harbor, Staten Island, for the manufacture of hydro-carbon engines for stationary and marine purposes, and other kindred lines. The principal product will be the two-cycle engine, formerly made by the International Gas Engine Company. This they are perfecting, and they state that slight changes, already made, have increased the actual horse-power, as shown by brake tests, 30 per cent. over the power at which the engines were catalogued, without increase of fuel consumption. The officers and directors are Harry T. Shriver of T. Shriver & Co., president; Julian A. Giles, vice-president and general manager; O. R. Ketcham, secretary; John H. Brewster, Jr., treasurer; Maxwell Wyeth of Philadelphia, and Francis Carolan of Burlingame, Cal.

A proposition worthy of note has just shaped itself in the formation of the Electro Manganese Company of Canada, who are to erect a plant for the production of manganese. Plans have not as yet been fully worked out, and nothing has been done, so far, as to ordering machinery. B. E. Kingman, 542 Fifth avenue, New York, has the matter in charge.

Traveling cranes, hangers, shafting, belting and lighting apparatus are required by the National Water Tube Boiler Company, New Brunswick, N. J., for the new plant they recently erected on the Pennsylvania Railroad. The machine tools, engine and foundry equipment have been ordered.

William Nelson has associated himself with H. Bickford, Lakeport, N. H., manufacturer of boring and turning mills, and the business will hereafter be conducted under the name of H. Bickford & Co.

Though they are at present in the market for spike machines only, the Weller Rolling Mill & Forge Company of Anniston, Ala., will require a complete equipment for the forge department, which, they advise us, they will add to their plant. The company recently purchased the plant of the Anniston Rolling Mill Company, and are making effort to put it in proper condition for operation by May 18. The product will be merchant iron and steel, T-rails, angles, Channels and shapes. W. H. Weller is president; Jno. T. Weller, vice-president, and J. H. Harden, secretary and treasurer.

The Special Water Commission of Lancaster, Pa., will receive bids until June 8 for a 12,000,000-gallon direct acting duplex pumping engine and appurtenances, steel stand pipe, eight 20 to 30 inch hydraulic stop valves, standard screw valves of from 8 to 24 inches in diameter, 1312 tons of 16 to 30 inch cast iron pipe, special castings and steel spiral riveted pipe. Besides these improvements to the water works, which will cost $145,000, plans are in preparation for sewer improvements to the extent of $250,000. Specifications can be obtained at the office of the Water Commission, or of Samuel M. Gray, consulting engineer, Providence, R. I.

E. P. Roberts & Co., consulting engineer, Cleveland, Ohio, have opened a branch office at 25 Broad street, New York. This office has been placed under the management of William C. Andrews, who has been the Eastern representative of the company for some time, and will provide greatly increased facilities for following the interests of their clients.

The Power Specialty Company, New York, have furnished 16 10-foot Seymour fans for the cooling towers at the St. Louis Exposition through Westinghouse, Church, Kerr & Co. The combined delivery of these fans is over 2,000,000 cubic feet of air per minute, requiring less than 20 horse-power each to drive them. Seymour fans are used exclusively by Henry R. Worthington and the Alberger Condenser Company, and are one of the most efficient means of moving large volumes of air at moderate pressures, up to 2 or 3 inch water column, on such work as cooling towers, ventilating, mechanical draft and mine ventilation.

The Standard Steam Specialty Company, New York, have removed their offices to 542-544 West Broadway.

Rossiter, MacGovern & Co. have removed to more commodious offices in the Whitehall Building, 17 Battery place, New York.

### The New Orleans Machinery Bids.

*(By Telegraph.)*

Bids were opened by the Navy Department on 12th inst. for equipment for the new construction and repair shops to be built at the New Orleans Naval Station. Owing to the fact that the Bureau embraced entire equipment, including an elevator, in single class, only three bids were received which complied with requirements. They are as follows: Drew Machinery Agency, Manchester, N. H., $89,480; Niles-Bement-Pond Company, New York, $91,653; Manning, Maxwell & Moore, New York, $101,217. Bids of the following firms were rejected as informal, covering only part of class advertised: Otis Elevator Company, New York; Becker-Brainard Milling Machine Company, Hyde Park, Mass.; Fosdick Machine Tool Company, Cincinnati, Ohio; Alliance Machine Company, Alliance, Ohio; J. Clark, Jr., & Co., Louisville, Ky.; Northern Engineering Works, Detroit, Mich.; Waters Elevator Mfg. Company, Cincinnati, Ohio; Sterling Blower & Mfg. Company, New York.

## PERSONAL.

A. Rieppel, managing director of the Augsburg Nuernberg Company, is now traveling in this country. He recently closed the contract by which the Allis-Chalmers Company become sole licensees for the United States. Within the last few months the Nuernberg Company have received orders for some 50,000 horse-power. Mr. Rieppel will visit the new shops of the Allis-Chalmers Company, at West Allis, Wis., where the engines will be built.

John Galvin, Sr., superintendent of the Peru (Ind.) Steel Casting Works, has accepted a similar position in a steel plant at Chester, Pa.

G. W. Scott, consulting mechanical engineer, has moved from the Rookery, Chicago, to offices in the Security Building.

H. R. Sloat, assistant secretary and treasurer of the Tennessee Coal, Iron & Railroad Company, has been elected a director to succeed E. R. Chapman, who asked to be relieved from the duties of the office. The other directors were re-elected.

James B. Meyers, formerly sales agent for Spang, Chalfant & Co., Pittsburgh, is now associated with Casey & Thompson, Incorporated, Chicago, Western sales agents of the Wheeling Steel & Iron Company. On May 1 the firm moved to more commodious quarters at 1304 Marquette Building.

Albert L. Cromlish has been appointed assistant superintendent of the blast furnaces of the United States Steel Corporation at Sharon and South Sharon, Pa.

George H. Bowler, well known in the machinery trade in Ohio, has been appointed general manager of the American Foundry & Machine Company of Ravenna, Ohio. He will have his headquarters at 507 Williamson Building, Cleveland, and will retain his connection with George H. Bowler & Co., dealers in second-hand machinery.

Richard C. Smith, until recently connected with the specialty sales department of the American Steel & Wire Company, has been appointed New York sales agent of the National Steel & Wire Company of New Haven, Conn., with offices in the Mills Building, 15 Broad street, New York.

## Philadelphia Foundrymen's Association.

The regular one hundred and twenty-eighth meeting of the Philadelphia Foundrymen's Association was held at the Manufacturers' Club, Broad and Walnut streets, in that city, Wednesday evening, May 6. The president, Thomas Devlin, occupied the chair and called the meeting to order at the usual hour. The attendance was the largest that has gathered at these meetings for a long period, and included, among others:

Geo. Rominger, Girard Iron Works, Philadelphia.
Wm. Dette, Wm. Dette & Co., Philadelphia.
Phillip C. Smith, Ingersoll-Sergeant Drill Company, Easton, Pa.
O. J. Ward, Howe Scale Company, Philadelphia.
A. G. Warren, J. W. Paxson Company, Philadelphia.
Wm. Adams, Wm. Adams & Co., Philadelphia.
T. B. Harkins, T. B. Harkins & Co., Bristol, Pa.
Thos. Devlin, Thos. Devlin Mfg. Company, Philadelphia.
P. D. Wanner, Reading Foundry Company, Reading, Pa.
Mr. Einwechter, Girard College, Philadelphia.
Jas. McAnnally, Harlan & Hollingsworth Company, Wilmington, Del.
H. P. Jackson, Harlan & Hollingsworth Company, Wilmington, Del.
F. F. Newcomb, Wm. Dette & Co., Philadelphia.
T. R. Coggeshall, Girard College, Philadelphia.
W. H. Shelmire, Jr., Creswell & Waters Company, Philadelphia.
W. S. Bickley, Penn Steel Casting Company, Chester, Pa.
N. D. Powell, Penn Steel Casting Company, Chester, Pa.
Eugene Buckman, New Haven, Conn.
M. Sims, New Haven, Conn.
R. C. Oliphant, Trenton Malleable Iron Company, Trenton, N. J.
S. M. Oliphant, Trenton Malleable Iron Company, Trenton, N. J.
H. O. Evans, Thos. Devlin Mfg. Company, Philadelphia.
Thos. J. Kelley, Abram Cox Stove Company, Philadelphia.
Jno. Glover, Glover Bros., Frankford, Philadelphia.
A. A. Miller, *The Iron Age*, Philadelphia.
Thos. Holt, Camden Foundry Company, Camden, N. J.
Geo. C. Davis, chemist, Philadelphia.
P. L. Lanning, Perseverance Iron Company, Philadelphia.
A. Simonson, Wm. Wharton, Jr., & Co., Philadelphia.
Godfrey Luckhardt, Cohocksink Brass Foundry, Philadelphia.
Geo. W. Walker, J. Thompson & Co., Philadelphia.
J. Thompson, J. Thompson & Co., Philadelphia.
Ed. L. Wallace, J. Thompson & Co., Philadelphia.
C. D. Matthews, Camden Iron Works, Camden, N. J.
Edwin C. Wills, Evans-Wills Steel Process Company, Rahway, N. J.
R. S. Newbold, R. S. Newbold & Son Company, Norristown, Pa.
A. E. Outerbridge, Wm. Sellers & Co., Philadelphia.
Dr. Edmund A. Engler, Worcester Polytechnic Institute, Worcester, Mass.
E. E. Brown, E. E. Brown & Co., Philadelphia.
C. R. Brown, E. E. Brown & Co., Philadelphia.
A. D. Wallace, E. E. Brown & Co., Philadelphia.
W. H. Ridgway, C. Ridgway & Son Company, Coatesville, Pa.
P. S. Braucher, P. & R. Shops, Reading, Pa.
J. S. Hibbs, J. W. Paxson Company, Philadelphia.
Fred. Bateman, Bateman Mfg. Company, Grenloch, N. J.
A. W. Lilley, Olney, Pa.
J. Hy. Pepper, Philadelphia.
Wm. Hanson, Pennsylvania Iron Works, Philadelphia.
H. A. Gillis, American Locomotive Company, Richmond, Va.
Dr. Ed. Kirk, Philadelphia.
Fred. Sabin, North Wales Foundry Company, North Wales, Pa.
Wm. Holten, North Wales Foundry Company, North Wales, Pa.
J. R. Lawrence, Jerome Keeley & Co., Philadelphia.
W. O. Steele, Philadelphia.
Dr. G. Alleman, chemist, Swarthmore, Pa.
Edw. D. Vaill, Philadelphia.
W. P. Dallett, Philadelphia.
M. P. Walker and H. W. Coleman, J. K. Dimmick & Co., Philadelphia.
Howard Evans, J. W. Paxson Company, Philadelphia.

The minutes of the previous meeting were dispensed with in the usual manner. The treasurer reported a balance of over $2100 in the treasury and all bills paid.

The Cresswell-Waters Company, iron founders and machinists, Nicetown, Philadelphia, whose application had previously been favorably acted upon in committee, were unanimously elected members of the association.

A committee appointed to prepare resolutions on the death of the late ex-president, Thomas I. Rankin, presented them. After eulogistic remarks by W. H. Ridgeway, P. D. Wanner, Josiah Thompson and others, the resolutions were unanimously adopted.

The papers before the meeting for the evening consisted of one by Dr. Edmund A. Engler, president of the Worcester Polytechnic Institute, Worcester, Mass., entitled "Foundry Work at the Worcester Polytechnic Institute," and a paper on "The Evans-Wills Process for Making Steel Castings from Cupola Metal," by E. Cooper Wills, Rahway, N. J., both papers being illustrated by means of lantern slides.

E. Cooper Wills' paper on the Evans-Wills process was more of the nature of a discussion, the apparatus having been illustrated in the March 19 issue of *The Iron Age*. Mr. Wills said in part:

### The Evans-Wills Steel Converter.

The Evans-Wills steel converter is composed of two sections, a dome section supported on a base plate, as shown, with a regular foundry ladle in position under the dome section, thus forming the complete converter. You will notice that the whole structure is rocked on or from the axis of the base plate by an hydraulic cylinder, and by this means we change the level of metal relative to the tuyeres in the ladle section and dome section. The cupola leads to an opening in the dome section, through which the metal is run into the ladle, until the ladle is full up to the tuyeres. We leave an opening in the lip of the ladle 6 x 7 inches, which is opposite to the tuyeres; the lower part of this opening is on a level with the tuyeres when the converter is thrown back to fill the ladle with metal so that any overplus iron will run out and not fill the tuyeres. The metal is skimmed off clean through this opening at the lip. Then a plug is put into each opening, and from 2½ to 5 pounds pressure of air is turned into the bath of metal through the tuyeres, at the same time causing the metal to raise above the tuyeres by moving the converter on its axis. The length of blow is determined by the depth to which the tuyeres are immersed and the amount of air forced through or into the metal. It is from 12 to 40 minutes, and also depends on the grade of steel which is to be made.

Three ladles are used with each dome. After a heat has been blown in the first ladle it is taken out to pour it, the second ladle is put under and a heat blown in it. A reserve ladle is always ready, which gives a chance to repair any damage to tuyeres or lining.

The cinder or slag is run off the metal about the time the ferromanganese and ferrosilicon are added by driving the plug out at the lip of the ladle as the converter back is brought back to its former position. In this manner there is eliminated that portion of the phosphorus which is contained in the slag before the reaction in the metal takes place.

By making the steel direct in the ladle, the lining of the ladle is as hot as the steel itself. This keeps the metal hot and fluid much longer and also brings the slag to the top. The smallest work is poured successfully as well as heavy work.

The Evans-Wills Steel Process Company, Pier 45 North Philadelphia, Pa., furnish the converters.

At the conclusion of the reading resolutions thanking both Dr. Engler and Mr. Wills for their papers were passed, after which the meeting adjourned and those present proceeded to the roof garden of the club where luncheon was served during which T. R. Coggeshall, H. A. Gillis and others made interesting remarks.

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The seventeenth annual convention of the American Order of Steam Engineers is in session in Pittsburgh this week. Clifford P. Williams of Philadelphia is president and James H. Stalling of Baltimore is secretary. Some 65 delegates, coming all the way from Maine to California, are in attendance at the convention.

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A general strike of the brick makers and clay miners employed by the Harbison-Walker Refractories Company of Pittsburgh was started last week. The men demand that the concern recognize union labor, which has been refused.

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The new steel plant of the Alan Wood Iron & Steel Company, at Ivy Rock, near Conshohocken, Pa., has been started. It contains five open hearth furnaces.

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The German newspapers announce that the Minister of Finance, Herr von Rheinbaben, is on his way to this country to study its resources. He will be accompanied by Moritz Boeker of Remscheid, who is thoroughly familiar with the iron industry and who has been in this country before.

# HARDWARE.

THE announcement that the representatives of the NATIONAL RETAIL HARDWARE DEALERS' ASSOCIATION are to meet in conference with the representatives of the NATIONAL HARDWARE ASSOCIATION will be recognized as an important step in bringing these two great departments of the trade into proper relationship. The invitation for such conference, coming as it does from the jobbers, is a recognition both of the organization which is beginning to be representative of retail interests and also of the desirability, not to say the necessity, of recognizing in a practical way the rights and interests of the distributers of Hardware throughout the length and breadth of the land.

There are many questions which may appropriately become subjects for consideration at such a gathering, for at many points the two great divisions of merchants in the Hardware field have more or less identity, if not conflict, of interest. The problem as to the best methods by which the demoralizing influence of catalogue and mail order houses can be met is one which at the present time is prominently before both associations, and is in itself one of sufficient complexity and difficulty to call for grave consideration, as it directly affects the welfare of both classes of merchants. It is, however, only one of many questions. The extent to which jobbers are engaged in retail business is another troublesome feature of the situation, and in some parts of the country the manner in which they conduct this department calls out energetic and well founded protests from the retail trade. The desire of the jobbing trade that retail merchants should purchase their goods from them rather than from the manufacturers may be set over against the desire of the retail merchants that the jobbing trade should leave retailing entirely to retailers. Such changes in existing methods would be revolutionary and attended by so many practical difficulties that there is little probability that it will be found feasible to put into effect these attractive theories. It is likely that retailers will continue to buy many lines of goods from manufacturers and that jobbers will continue to retail. Conferences as to how friction can be minimized and a due recognition of the rights and privileges of each class of trade secured are certainly in order. The question, too, as to the differentials which should be observed between the different kinds of trade is of sufficient complexity and importance to call for serious consideration. The representatives of the retail trade will naturally insist that the large and enterprising retailer should be given better prices by both jobber and manufacturer than are given to small and unprogressive merchants, and that at the same time there should be an opportunity to develop from a prosperous retail business into a gradually increasing jobbing trade. The subject, too, of syndicate buying has some phases which call for consideration from its relation to trade interests in several directions. Jobbers certainly will not be disposed to claim a monopoly of the system, and while they can hardly be expected to favor the formation of the retail syndicates they should not interpose serious obstacles.

The whole subject of the determination of prices to the various classes of buyers is, however, beset with many difficulties. In one respect the retail trade at the present time labors under a serious disadvantage from the application of conflicting principles. If the manufacturers' quotations were graded consistenly, with certain prices to the retail trade and certain other lower prices to the jobbing trade, it would protect the retail merchant in good measure from very difficult competition which he is obliged to carry on with the catalogue houses and department stores. The trouble now is that in view of the quantity of goods which these catalogue houses and department stores purchase they buy at as low figures as do the jobbers, and, of course, much lower than does the ordinary merchant. This furnishes a definite handicap to the retail merchant, and makes it almost impossible for him to compete. If, on the other hand, prices were graded according to quantity, this competition would, of course, be entitled to low prices on their heavy purchases, but at the same time the retail merchants would be given an opportunity to combine their orders and obtain prices at least approximately as low. Under the existing conditions where there are classified lists which favor the jobber, or where manufacturers without formal lists are accustomed to give the jobbers a differential of from 10 to 20 per cent., while at the same time catalogue houses and department stores can buy at these jobbers' prices, the retail merchant is obviously at a serious disadvantage. This phase of the problem is certainly deserving the best consideration of the trade, and if the approaching conference can discover some method of avoiding the difficulty and correcting what is conceded by all to be an unsatisfactory condition, the wisdom of those who have been instrumental in bringing about the conference will receive ample justification.

## Condition of Trade.

Notwithstanding the falling off within the past two weeks in the demands made by the jobbers upon manufacturers, there is still an active business doing. The jobbers are fully occupied in taking care of the orders of the retail trade, which are coming in to them in good volume and variety. Seasonable goods naturally have a prominent place. While in a few lines there are indications of a scarcity, as a general rule the market is fairly well supplied. The business of the merchants throughout the country is active and is interfered with principally by the attention which is being given to outdoor occupations, so that there is a steady movement of goods, calling for frequent replenishing of stocks. Manufacturers, too, are with scarcely an exception very busy and many of them are disposed to welcome something of a let up in the demand, because it may give them an opportunity to clear up their order books and accumulate something of a stock, as they have not been able to do for a long time. The principal source of disquietude is connected with labor agitation and in many parts of the country there is more or less disturbance on this account, with a possibility of a still more serious interference with the regular course of things in the future. There has been as the result of the heavy pressure on manufacturing facilities and the scarcity of labor a gradual advance, little by little, in the wages of the operatives, and this, with the price of the raw material, has contributed strength to the market. Prices of Hardware generally show little change and may be referred to in a general way as quite steady, there being more advances than declines. Manufacturers and merchants are watching with some solicitude the course of the market in the raw material. While any violent reduction in prices would be regretted, there is a general feeling that some concessions would be reasonable and in the long run desirable. Continuance of prosperity throughout the country, with the full employment of labor at remunerative wages and the excellent reports, taken all in all, in regard to the crops, induce the continuance of a hopeful feeling

as to future business. The exportation of manufactured products of metals, and especially of iron and steel, still continues in fair quantities, holding its own moderately well but not making noteworthy progress. The cause naturally is the continued large demand of the domestic market, which manufacturers as a rule choose to satisfy rather than sell abroad at lower prices and where our tariff does not help them. An instance of this occurred recently when a large export house were unable to place an order aggregating about $175,000 of metal material that only involved some slight changes in machinery to meet the specifications, but as the manufacturers were crowded with orders it was deemed inadvisable to meet conditions that with a slower market would have been eagerly accepted. New York exporters with world wide connections say that notwithstanding the partial cessation of exports of manufactured metal goods a moderate or reasonable recession in price will put them in a position to resume selling abroad in a large way. Much foreign business has been handled even during the last few years of higher prices, but there is not the vigor and initiative noticeable that prevailed when the home market was less active.

### Chicago.

(*By Telegraph.*)

Taken all in all, there is a fair volume of business being transacted throughout the various departments of the Hardware trade, and with few exceptions prices of leading articles are well maintained. Compared with a year ago trade seems to be about of equal proportions, but it should be noted that there is now, as there was a year ago, a natural tendency toward a decrease in nearly all departments. It is interesting to note that while new business in Wire Nails and other staple articles of this character is falling off the tonnage on the books of manufacturers is many thousand tons greater than a year ago. While this condition is possibly due to some extent at least to the difficulties recently experienced in making shipments, it also reflects a larger volume of business in some lines. Shipments of Nails and Barbed Wire are much more satisfactory now, but in Plain Wire and Fencing there is little improvement, new business crowding the old, which is of special significance as being directly opposite to trade in other lines. While mills are getting into better conditions, and are more amply supplied with raw material, they are not entirely free from labor difficulties. Manufacturers of Edge Tools are still far behind in fulfilling contracts, manufacturers of Chisels, Saws and Hammers being especially embarrassed. There are several large contracts of Builders' Hardware pending, among the most important being the court house at Indianapolis and the Wanamaker Building at New York. Bids for the latter will close at Chicago on Saturday and at New York on Monday next. The contract for the First National Bank Building at Cincinnati was closed today. The recent action of manufacturers of Locks and other Builders' Hardware was made in anticipation of bringing about a steadier market, and no lump price on contracts will be made hereafter, but there is some inkling that there may be a readjustment of prices in this line. Both the city and country jobbing trade in Builders' and Shelf Hardware is only moderate, the tendency being toward a falling off rather than otherwise. One or two more manufacturers of Stove Pipe and Elbows report their capacity fully sold for the fall season and a better demand for Drip Pans is also experienced. There has been some little trading in Shovels and Axes for fall delivery, but the trade war in the latter is not entirely settled and has resulted in lower prices on some brands. Manufacturers of Screws and Staples report a fairly satisfactory trade, but it is mainly of a jobbing character, and prices are apparently well sustained. Stove Bolts are not selling very freely, and Tire Bolts are especially slow, as Wagon and Carriage manufacturers largely carried over stock of this kind from last year, and with a quiet trade at present they are not represented very fully in the market. Manufacturers of Railroad Spikes report an active trade, and with some difficulty in obtaining prompt supplies prices on extras have been advanced by independent producers about 5 cents. Trading in Steel goods is about over for the season, but there continues to be a number of fair-sized orders for Forks, Scythes, Snaths, &c. Jobbers report a fair demand for summer goods such as Lawn Mowers, Refrigerators, Ice Cream Freezers, Hose and Chains. The demand for Heavy Hardware has not been especially active, and the tendency has been toward a little easier feeling, especially in Bars, Hoops and Black and Galvanized Sheets, although not to the extent of reducing prices materially.

### St. Louis.

(*By Telegraph.*)

May opens up well and bids fair to show a good average of sales. It is most encouraging to the jobbing houses in St. Louis that the dealers in this territory keep up such a well sustained demand for all seasonable lines. It would seem that dealers generally are keeping a closer check on stocks and are avoiding the possibility of being caught short by placing orders for a new supply well in advance. This fact and the demand for a variety of articles considered in the nature of luxuries in times past are features worthy of special note. While the World's Fair enterprise has been the signal for a large amount of new building and improvements locally, the condition of the material supply and labor market in the matter of costs has reached a point where many plans contemplated by business interests, such as the erection of new warehouses, &c., will not be carried forward until conditions generally come down to a more even and satisfactory basis. It is noticeable that the uncertainty attending steady employment here of a great deal of the skilled labor in the building lines is being appreciated by the men themselves, and although wages are on a lower plane in other cities, the certainty of steady work seems to be the incentive for many to seek employment elsewhere.

## NOTES ON PRICES.

**Wire Nails.**—The urgent demand is over for the season, but there is still a fair amount of new business being received by the mills. Most of these, however, are well employed on contract orders. Shipments are more satisfactory, but not all that could be desired on the part of railroads. The tone of the market is firm. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

| | |
|---|---|
| Jobbers, carload lots | $2.00 |
| Retailers, carload lots | 2.05 |
| Retailers, less than carload lots | 2.15 |

*New York.*—While labor trade conditions in this vicinity have not improved during the past week, orders for small lots from store are keeping up remarkably well. It is a cause of some surprise to the dealers that business holds to present proportions. The market is firm at the following quotations: Single carloads, $2.20; small lots from store, $2.25 to $2.30.

*Chicago, by Telegraph.*—There has continued to be a falling off in business and the mills have made further progress in deliveries on old contracts. Otherwise the market is without change, there being a fair jobbing trade and prices firm. Official quotations are $2.15 to $2.20 in carload lots, f.o.b. Chicago. Broken cars sell at 5 to 10 cents higher. For Galvanizing 75 cents per keg and for tinning $1.50 extra per keg is charged.

*St. Louis, by Telegraph.*—A fair amount of trade continues to be reported by jobbing interests, and in small lots from store $2.35 is the quotation.

*Pittsburgh.*—The market on Wire Nails continues in very satisfactory condition. A number of contracts placed by large buyers some time since have expired and new orders are being placed at present prices. General demand is good, and the mills have a good deal of business on their books and are running to full capacity. The tone of the market is firm and prices are being rigidly held. We quote Wire Nails as follows: $2 in carloads to jobbers, $2.05 in carloads to retailers and

$2.15 in small lots, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days; for galvanizing Nails 75 cents per keg is charged and for tinning Nails $1.50 per keg extra.

**Cut Nails.**—Mills still experience considerable difficulty in making prompt shipments on account of the scarcity of Steel. Iron Cut Nails are especially scarce. The market is strong and quotations are as follows: $2.15, base, in carloads, and $2.20 in less than carloads, f.o.b. Pittsburgh, plus freight in Tube Rate Book to point of destination; terms 60 days, less 2 per cent. off in 10 days.

*New York.*—The demand for Cut Nails is in about the usual proportion to that of Wire Nails. Requirements are not large but are considered satisfactory under present conditions. The market continues firm, and quotations for carloads and less than carloads are as follows:

| | |
|---|---|
| Carloads on dock | $2.29 |
| Less than carloads on dock | 2.33 |
| Small lots from store | 2.40 |

*Chicago, by Telegraph.*—There has been a more ample supply of Cut Steel Nails, but Cut Iron Nails are still scarce. The demand is not especially active, but the market remains firm as previously quoted on the basis of $2.30 in carload lots and $2.35 in less than carload lots for Steel, Chicago. Iron Nails are held at $2.45 to $2.50 per keg from store.

*St. Louis, by Telegraph.*—Jobbers continue to handle a moderate amount of Nails and quote in small lots from store Steel at $2.40 and Iron at $2.55.

*Pittsburgh.*—We note a steady demand for Cut Nails and the tone of the market is very firm. There is still a shortage in supply of Steel and this is causing the manufacturers to operate only a sufficient number of machines to meet the existing demand. Prices are being firmly held and are as follows: Steel Cut Nails, $2.15, base, in carloads and $2.20 in less than carloads; Iron Cut Nails, $2.25, base, in carloads and $2.30 in less than carloads, plus freight in Tube Rate Book to point of destination, 60 days, less 2 per cent. off in 10 days.

**Barb Wire.**—Orders being received at the mills have not been large, but specifications on contracts are liberal. Shipments are being made with considerable promptness. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

| | Painted. | Galv. |
|---|---|---|
| Jobbers, carload lots | $2.30 | $2.60 |
| Retailers, carload lots | 2.35 | 2.65 |
| Retailers, less than carload lots | 2.45 | 2.75 |

*Chicago, by Telegraph.*—While shipments are being made more readily on old contracts, the mills are well supplied with business for 60 days or less and new orders are less frequent and for less tonnage. The jobbing trade has been fair although less active, but the market has continued firm. Galvanized Wire has continued to sell on the basis of $2.75 to $2.80 in carload lots and Painted at $2.45 to $2.50, the outside price being to retailers. For small lots 5 to 10 cents extra is charged. Staples in carload lots sell as follows: Polished, $2.30 to $2.35, and Galvanized, $2.70 to $2.75, the outside price being to retailers.

*St. Louis, by Telegraph.*—Trade continues in fair volume and for the season is considered quite satisfactory. Jobbers quote in small lots from store Painted at $2.60 and Galvanized at $2.90.

*Pittsburgh.*—Mills are now making prompt deliveries, having caught up to a considerable extent on back orders. A good deal of new business is being placed at current prices and the tone of the market is very firm. We quote, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days: Painted, $2.30; Galvanized, $2.60, in carloads to jobbers; Painted, $2.35; Galvanized, $2.65, in carloads to retailers; Painted, $2.45; Galvanized, $2.75, in small lots to retailers.

**Smooth Fence Wire.**—Both new orders and specifications on contracts continue in large volume. Some sizes of Galvanized Wire are reported as being difficult to obtain. Quotations are as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. discount for cash in 10 days:

| | |
|---|---|
| Jobbers, carloads | $1.90 |
| Retailers, carloads | 1.95 |
| Less than carloads | 2.05 |

The above prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

| | 6 to 9 | 10 | 11 | 12 & 12½ | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|
| Annealed | Base. | $0.05 | .10 | .15 | .25 | .35 | .45 | .55 |
| Galvanized | $0.30 | .35 | .40 | .45 | .55 | .65 | 1.05 | 1.15 |

*Chicago, by Telegraph.*—Orders booked and unshipped are very heavy and the demand continues very active for both Wire and Fencing, a strong tone prevailing. The jobbing trade has continued on a liberal scale and the tone of the market has been firm. The following are the prices current: Nos. 6 to 9 on the basis of $2.05 to $2.10 in carload lots on track and $2.15 to $2.20 in less than carload lots on track and $2.15 to $2.20 in less than carload lots from store, Galvanized bringing 30 cents extra for Nos. 6 to 14 and 60 cents extra for Nos. 15 and 16.

*St. Louis, by Telegraph.*—The demand for Smooth Fence Wire has been very well sustained and jobbers repeat the former quotations in small lots from store of No. 9 at $2.30 and Galvanized 30 cents higher.

*Pittsburgh.*—New business is liberal and the mills have a good many orders on their books which will keep them fully employed for some time to come. The market is firm and there is an entire absence, we are advised, of any concessions in prices, which are as follows: Plain Wire, $1.90, base, for Nos. 6 to 9 in carloads to jobbers, $1.95 in carloads to retailers and $2.05 in small lots to retailers; Galvanized, 30 cents extra for Nos. 6 to 14 and 60 cents extra for Nos. 15 and 16.

**Revolvers.**—Smith & Wesson, Springfield, Mass., manufacturers of Revolvers, have issued a new price-list of their Firearms for dealers, dated May 1, superseding the previous list of January 1, 1903. The radical departure in this, as contrasted with former issues, is the making of a uniform list for any length in each model, instead of separate prices according to the length of barrel. This means an advance of from 25 cents to $1.25 on the bulk of this product with rubber stocks, the advances in Revolvers with pearl and ivory stocks being still greater. These goods are carried in stock by the M. W. Robinson Company, 79 Chambers street, New York.

**Sand Paper.**—The associated manufacturers of Sand Paper are working together harmoniously, and prices are reported to be steadily maintained. Some change has recently been made in the matter of freight allowance, and instead of the former arrangement delivery is now given in a territory which may roughly be described as having on its boundaries Montreal, Milwaukee, St. Louis, Baltimore and Boston.

**Paris Green.**—New business is light, but manufacturers are at work filling contract orders. The market is dull and devoid of interesting features. Quotations are as follows:

| Less than 1 ton. | Per lb. |
|---|---|
| Arsenic kegs or casks | 13½c. |
| Kegs, 100 to 175 pounds | 14c. |
| Kits, 14, 28, 56 pounds | 15c. |
| Paper boxes, 2 to 5 pounds | 15c. |
| Paper boxes, 1 pound | 15½c. |
| Paper boxes, ½ pound | 16c. |
| Paper boxes, ¼ pound | 17c. |

One to 5 tons, 1 cent per pound less; 5 tons and over, 1½ cents per pound less.

**Cordage.**—Demand for Rope is excellent, and manufacturers are not accumulating stocks to any extent. Quotations are as follows, on the basis of 7-16-inch and larger: Sisal, according to quality, 8¾ to 10 cents; Manila, on the same basis, 11½ cents per pound. A rebate of ¼ cent per pound is allowed on large lots.

**Glass.**—A meeting of the representatives of the American Window Glass Company and the Jobbers' Association is scheduled to be held next week. It is understood that the jobbers will formulate some definite course of action to be pursued at the meeting, so that they may act in concert and not as individuals. There seem at present to be two alternatives open to the jobbers, either to accept an allotment of Glass from the American Company for nearby shipment, or, not doing this, to run the risk of having the company put in effect the threat of selling direct to the trade. The result of the meeting will probably depend, to a considerable extent, upon whether the American Company expect to put

any considerable amount of machine made Glass on the market during next fire. It is reported that Glass can be made by the blowing machine, controlled by the American Company, from 40 to 80 per cent. cheaper than by the old process. Quotations of the jobbers' association, for either single or double strength, are as follows:

| | Discount. |
|---|---|
| From store | 90 and 10 % |
| F.o.b. factory, carload lots | 90 and 20 and 2½ % |
| F.o.b. factory, 2000-box lots | 90 and 25 % |

**Oils.**—The Linseed Oil market remains quiet, with light demand. Manufacturers claim that selling Oil at prices that have ruled for some time is a losing business, at the cost of seed. They are therefore making no attempt to sell, but are filling such orders as come to them. One mill, it is understood, disposed of its stock of Oil and has closed down. Manufacturers have attempted to advance prices, but in the face of light demand have not succeeded in doing so. City Raw is quoted at 44 cents per gallon in lots of five barrels or more, and out of town Raw at 41 cents in like quantities. Cod Oil has advanced slightly in price with higher values anticipated.

## CONFERENCE BETWEEN JOBBERS AND RETAILERS.

There is to be a conference in Philadelphia, May 18, 19 and 20 between the officers of the NATIONAL RETAIL HARDWARE DEALERS ASSOCIATION and the officers and directors of the NATIONAL HARDWARE ASSOCIATION. The retail organization will be represented at this conference by W. P. Bogardus, Mt. Vernon, Ohio, president, and M. L. Corey, Argos, Ind., secretary, and also by T. Frank Ireland, Belding, Mich., and John R. Taylor, Little Falls, N. Y., as well as other directors. This conference is brought about at the invitation of the NATIONAL HARDWARE ASSOCIATION, and doubtless reflects the sentiment in their organization in favor of co-operating as fully as possible with the retail merchants in their efforts to eliminate or minimize existing trade evils.

### Letters from Retail Merchants.

In *The Iron Age* of last week attention was directed editorially to the desirability of having the retail merchants represented at the great semiannual gatherings of the jobbers and manufacturers. This suggestion has been received with evident approval by the trade in different parts of the country as evidenced by the letters which have come to us from representative Hardware merchants. Extracts from some of these letters may be of interest as indicating the way in which the project is regarded by our correspondents:

*From a Prominent Representative of Retail Organization:* I have read with interest your editorial in *The Iron Age* and note the able manner in which the subject of retail representation is presented. I have been for some time of the opinion that nothing but good can result from conferences of the three branches of the trade, and also that when the overtures are made the National Retail Hardware Dealers will respond promptly with their best men.

While the competition of the catalogue house and department store is the important question in the retailer's mind, yet there are others that will readily be disposed of and have been of considerable annoyance. The position you have taken has, in my opinion, been very influential in engendering the good feeling that now exists, and I believe will bring about a thorough understanding between the classes interested.

---

*From the President of a Western Association:* I believe great good would result from retail representation at the meetings of jobbers and manufacturers.

Maintenance of standard of quality of goods can best be accomplished by their being sold by the regular dealers, and no one can more forcibly present the reasons for the requests that are being made upon manufacturer and jobber than the retailer who is pushing his business.

If the mail order system grows it will make unprofitable the business of the weaker jobbers and retailers, and I would sooner take my chances with the stronger retailers than the large jobber—if the evolution of trade continues in that direction.

---

*From a Leading Connecticut Merchant:* I can only approve of the suggestion as set forth in *The Iron Age*, May 7, in relation to the retail Hardware merchants being represented at the gatherings of the jobbers and manufacturers.

Of course the retailer is considered the last "rung" in the ladder, but just the same he is the first one to get the money started back from the consumer to the manufacturer, and I have no doubt that the organization of the Retail Hardware Trade, as it has been progressing during the past year or two, will bring the retail trade to the attention of the manufacturers and jobbers, and we think they will be perfectly willing and glad to have them represented at their gatherings. It would certainly result in good to all concerned, in my opinion. The jobbers should be anxious to become better acquainted with the leading retail dealers, and these occasions would give them an opportunity to learn what the conditions are in relation to the retail trade throughout the country by meeting and talking with representatives in this line.

The average jobber has no personal acquaintance with the larger part of his customers; he depends wholly upon his traveling men for information, and we often find after becoming acquainted with the head of the house our relations are much more cordial.

I repeat that it seems a wise action to take, if they should follow your suggestion.

---

*From an Official of an Eastern Association:* I have carefully read the editorial referred to covering the subject of retail representation at the great gatherings of jobbers and manufacturers. It is my belief that you have sounded the keynote, and that this suggestion will meet with the hearty indorsement of the retail trade throughout the country. I am fully convinced that if the retail trade could be given a representation at these gatherings much good would come from such an arrangement. Undoubtedly much light would be thrown upon some of the dark corners at such a meeting. The retailer would then be in a position to state plainly the different causes from which he is suffering at the present time, and being brought right into personal contact with the jobber and the manufacturer it would seem that the very best of results could be obtained from such a meeting. As far as I am concerned and the people whom I represent, I am pleased to say that we would be in full sympathy with such a convention. I sincerely trust that such a meeting may be brought about at an early date.

## SPRING FOLDER AND PRICE-LIST.

BYRON E. WALTER, South Milwaukee, Wis., recently mailed to customers, present and prospective, an eight-page folder and price-list, under the title of "Spring and Summer Hardware." On the first page the maxim, "Honest Values Guide Trade," is printed conspicuously. The goods to which attention is called include Carpenters' and Machinists' Tools, Mixed Paints, Oils, Brushes, Garden Tools, Lawn Mowers, Screen Wire, Doors and Fencing, Refrigerators, Ice Cream Freezers, Kitchen Utensils, Vapor Stoves, Steel Ranges, &c. With the exception of the Stoves and Ranges, an itemized list of the different lines is given with prices, a line being devoted to each item. Under the heading of Tools, prices are given on 16 different kinds, Carpenters' Hammers being priced at from 25 cents to $1, Machinists' Hammers, 50 to 75 cents; Block Planes, 25 cents to $1. The folders were mailed in sealed envelopes, thus raising them above the ordinary dodger. The names of the parties to whom the folders were sent were taken from the city directory.

## KEEP THE WINDOW DRESSED.

BY WM. H. MILLER.

MANY merchants do not think it necessary to devote any time to their windows. They throw in a few things as quickly as they can just to fill up the space. While such a dealer may have been known to keep a Hardware store, soon the people passing by get the idea he keeps a sort of a junk shop, although some beautiful things are kept on the shelves carefully wrapped up in paper just as they came from the factory.

CLEAN GLASS.

A clean, clear glass will show off a display of goods as a picture is shown in a frame. Nothing will give your customers the impression that you are a back number quicker than a dingy and dusty window. Do not allow dirt to accumulate in or around the goods displayed. No matter what your customers' tastes are, a visible accumulation of dust, and in the summer a collection of dead flies, will spoil the effect of your display.

DO NOT INTERFERE WITH THE WINDOW DRESSER.

Select your most ingenious, tasty and tidy clerk and give him the exclusive management of the window display. Impress upon him that your window display is your best advertisement. Encourage him to study how to produce the most attractive effects with the goods you have. Give him time to make a window display. Let him refuse to wait on customers until his display is made. Some merchants seem to think a clerk can make an elaborate window display and at the same time take care of just as much trade as at any other time, stop off every two or three minutes to chop off Iron, dig out Nails, weigh up a bill of Horseshoes or cut some threads on Gas Pipe, or settle some unsatisfactory deal about a broken Clothes Wringer that has only been used once, or make a Jack Knife good that the edge turned over while "just whittling pine." Or may be required to go down and set up a Grindstone that some one wants right away, and perhaps some fellow will want half a dozen sizes of Bolts, and doesn't know the size of any of them, and he will commence to claw over the boxes of Bolts, taking out everything he don't want and throw them back in the wrong places. Merchants cannot expect good results when a clerk's attention is constantly diverted from the very important object he wishes to accomplish. I wish to be emphatic on this point. *Give a man time, unmolested, to study how to best arrange his display neatly and artistically, and in a way that will attract the most attention.*

WHAT HE WILL DO.

After you have selected your most ingenious clerk, and have given him to understand that he may have the time to devote to the windows, you have solved the problem. He will see that the windows are washed often, and will keep them clean both inside and out. His genius will at once commence to expand along the line of artistic display. He will have the windows cased up on the inside to keep out the dust. He will think of more ways to arrange the goods than could be mentioned in a month. And then he will ask you to call attention to the windows in your local ads. He will display one class of goods in one window and something else in the other. He will sometimes use one kind of goods in a window showing different sizes and styles, and again for a change will show no two articles alike. Occasionally he will use a mechanical device operated by means of a small electric motor. He will, maybe, have it run a Grindstone and rig up a dummy of Father Time grinding his Scythe. He will do this by bending a stiff wire the shape of the human body, filling the clothes when drawn on with cotton waste. Another novelty would be to set some Ice Cream Freezers or Churns in motion. The ingenious clerk who has charge of the windows will not let one display remain so long that the goods become tarnished and shop worn.

MARKING PRICES

I do not advise marking prices on Hardware window displays. If your display attracts the customer as something he wants he will not be long coming in to inquire the price, and once in conversation with him your personal influence should be greater toward making a sale than a piece of pasteboard with some black figures on it.

Display your goods profusely, apparently regardless of expense. The more you display the more you will sell. Bring all your genius to bear on this point. It will pay.

## DEATH OF CHARLES G. DENNISON.

CHARLES GUSTAVE DENNISON, aged 61 years, a partner in the house of Sidney Shepard & Co., Buffalo, N. Y., and head of the house of C. Sidney Shepard & Co., Chicago, Ill., was buried from the residence of his late friend and business associate, James G. Forsyth, in Buffalo, Sunday May 10. Mr. Dennison, who resided in Hinsdale, Ill., left Chicago March 16 last to attend a board meeting of the directors of Sidney Shepard & Co. in Buffalo. Within a few hours of his arrival there his life long friend, Mr. Forsyth, member of Sidney Shepard & Co., died of paralysis after an illness of a year. That event is believed to have unbalanced Mr. Dennison's mind, already strained by overwork, probably causing him while mentally irresponsible to wander into the waters of the lake, his body being found below in the Niagara River, May 8, nearly two months later. After being connected with the Buffalo establishment of Sidney Shepard & Co. for a number of years and working up through the different positions to that of partner, Mr. Dennison went to Chicago in 1876 and since then had been largely instrumental in building up the business of the house in the West, which now has other branches in St. Louis, Kansas City, Denver, Seattle and San Francisco, which were organized by Mr. Dennison at different intervals in the last few years. Mr. Dennison's close application and devotion to business had impaired his health in later years, a condition which was accentuated two years ago when their entire Chicago plant was destroyed by fire.

The following tribute to his character and sterling worth as a man is from a close business friend and associate, and fitly expresses the very high regard in which he was held by all who knew him: "Quiet and dignified in manner, he was yet the friend of hundreds, and all who knew him regarded him with the highest esteem. He was a tireless worker, alert in business dealings, wise, absolutely honest and reliable in every small particular. A friend of those who needed a friend, an inspiration and example to those associated with him. He leaves a widow and two sons, to whom and to his partners and employees, with whom there existed the closest bonds of affection, the sympathy of his friends in the trade will be extended."

Lundt & Arndt, in the Hardware, Stove, Furnace and plumbing business, Blair, Neb., have dissolved partnership, Mr. Lundt retiring and F. W. Arndt purchasing his interest. The business will be continued by Mr. Arndt under the style of the Arndt Hardware Company. Mr. Lundt was born in Germany and came to America in 1867. After spending a year in New York City he came to Nebraska and worked a short time for H. C. Riordan in the Hardware business at De Soto. In the spring of 1869 the business was removed to Blair, and in the fall of that year Mr. Lundt started a tinshop on his own account. The business has since grown into one of the largest and best known retail concerns in Northeastern Nebraska. Mr. Arndt became connected with Mr. Lundt as partner in 1886, and has managed the concern for a number of years, so that he is well qualified to continue the business.

Melvin Tilley and J. C. Clutts have bought the Hardware business formerly conducted by E. E. Donaldson in Wellston, Ohio, and will continue under the style of Melvin Tilley Hardware Company. Mr. Tilley, who was for several years in Mr. Donaldson's employ, will manage the business. The old quarters will be materially enlarged and improved and the stock carried will be increased with a view to carrying on the wholesale as well as the retail business.

# HARDWARE FACTORY COST METHODS.

W. J. ADAM, Joliet, Ill., manufacturer of Prison and Asylum Work, Ornamental Steel Work, &c., writes: Like almost every one else, we have done considerable guessing and experimenting regarding how to determine manufacturer's costs, and have evolved a system with the aid of our neighbors and parties making a business of cost systems which answers our purpose fairly well. Our system is practically as follows:

## COST SYSTEM OF W. J. ADAM.

When an order comes in it is put on the order book, which contains all the information about the order. It is then given a number and placed on a factory order

**FACTORY ORDER.**

**Adam's Steel & Wire Works**

No. 14548 JOLIET, MAR. 28 1903

Ship by C R I & P R. R.

To Adams & Krach

Town Chicago

State

| | |
|---|---|
| 1 | Cage No 840 See Sketch attached |
| 6 | C. I. Posts. No 178 = 4'6" |

APR 9 1903

Filled Cameron

*Fig. 1.—Factory Order. (Size 3¼ x 6⅞ Inches.)*

blank, reproduced in Fig. 1, which gives the foreman all the information necessary, unless it be something that requires a sketch, such as is shown in Fig. 2, in which case the sketch is attached to the order card. The fore-

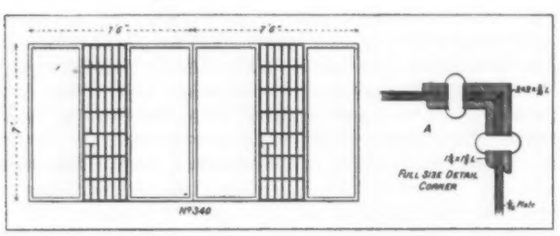



*Fig. 2.—Reproduction of Sketch, Greatly Reduced.*

man then gets out the stock, enters it on a material slip, Fig. 3, which is returned to the office and filed in a plain manila envelope bearing the order number. Should any further material be required additional material slips are made out bearing the same order number and they are returned to the office in the same manner. Daily the time slips for each man working on the job are also returned. They bear the man's name, his number on the pay roll, the order number, the date and the kind of work he did on this job, together with the time spent on it. Two of the slips are shown in Figs. 4 and 5. From these time slips the men receive their credit on the pay roll, after which the slips are filed in the proper envelope. When the job is finished the envelope is examined and the factory card returned to the office. The

**MATERIAL SLIP.**

Order No. 14548 Date April 1

| ARTICLE. | SIZE. | How Many. | ARTICLE. | SIZE. | WT. |
|---|---|---|---|---|---|
| F. H. S. B. | | | I Beam | | |
| R. H. S. B. | | | Channel | 4" | 104 |
| Mch. B. | ¾ X 5 | 12 | Angle | 2 X 2 | 96 |
| Carr. B. | | | Flat | 2 X ½ | 78 |
| Mch. Scr. | | | Round | ¾ | 70 |
| Set. Scr. | | | Oval | | |
| Cap. Scr. | | | Tool Steel | | |
| Drills | | | Cast Iron | | 495 |
| Taps | | | Wire | | |
| Dies | | | Rivets | | 65 |
| Files | | | Nuts | | |
| Locks | No 22 | 1 | Washers | | |
| Butts | 4 X 4 | 4 | | | |
| | | | Sheet Steel | No 14 | 1045 |

Issued by J. A. Received by Gray

*Fig. 3.—Material Slip.*

shipping bill and invoice are made out from the factory order, and then it goes to the cost clerk, who makes up the total cost of the job in question, as per cost card reproduced in Fig. 6. All materials used are entered on

**ADAM'S STEEL & WIRE WORKS—TIME SLIP.**

Name Tolyas No. 2

Order No. 14548 Date March 27 190 3

Kind of Work Making Sketch &c Time on this job 2 hours

Name of Piece

A Part of

Material

| STARTED NEW | CONTINUED | UNFINISHED | FINISHED |
|---|---|---|---|
| X | | | |

Foreman

*Fig. 4.—Time Slip. (Size 3 1-3 x 7 2-3 Inches.)*

this cost card, and the time spent on the job in each department, as shown by the time slips, is carried out, together with the rate per hour.

Up to this point we have the labor on the job and the

**ADAM'S STEEL & WIRE WORKS—TIME SLIP.**

Name Toney Fredericks No. 10

Order No. 14548 Date April 4 190 3

Kind of Work Forging Time on this job 4 hours

Name of Piece Number of Pieces 9

A Part of

Material

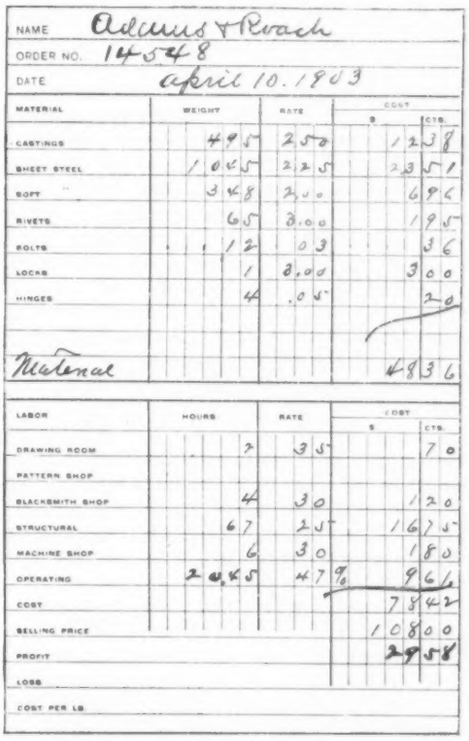
| STARTED NEW | CONTINUED | UNFINISHED | FINISHED |
|---|---|---|---|
| X | | | |

Foreman Gray

*Fig. 5.—Time Slip. (Size 3 1-3 x 7 2-3 Inches.)*

cost of the material. We then add the percentage necessary to charge against the job for operating expense. This we figure as 47 per cent. on the amount of the labor. The bare statement of this may be a little con-

fusing and needs a little additional explanation. The idea in this example is this: The total expense of a job being $100, the labor would be $68 and the operating expense $32. Therefore, 47 per cent. of the labor, $68, would be $32, so that in figuring adding 47 per cent. of the cost of the labor would bring a result in each job as above stated, labor $68 and operating $32. This 47 per cent. is made up from previous records and includes salaries, taxes, insurance, lighting, heating, teaming and all other expenses which cannot be charged directly against each job. Of course this may vary from year to year, but it is the only safe rule we know of. The amount may not


NAME Adams & Roach
ORDER NO. 14548
DATE April 10. 1903

| MATERIAL | WEIGHT | RATE | COST $ | CTS. |
|---|---|---|---|---|
| CASTINGS | 495 | 2.50 | 12 | 38 |
| SHEET STEEL | 1045 | 2.25 | 23 | 51 |
| SOFT | 348 | 2.00 | 6 | 96 |
| RIVETS | 65 | 3.00 | 1 | 95 |
| BOLTS | 12 | .03 | | 36 |
| LOCKS | 1 | 3.00 | 3 | 00 |
| HINGES | 4 | .05 | | 20 |
| Material | | | 48 | 36 |

| LABOR | HOURS | RATE | COST $ | CTS. |
|---|---|---|---|---|
| DRAWING ROOM | 2 | 3.50 | 7 | 00 |
| PATTERN SHOP | | | | |
| BLACKSMITH SHOP | 4 | .30 | 1 | 20 |
| STRUCTURAL | 67 | .25 | 16 | 75 |
| MACHINE SHOP | 6 | .30 | 1 | 80 |
| OPERATING | 2045 | .47% | 9 | 61 |
| COST | | | 75 | 42 |
| SELLING PRICE | | | 108 | 00 |
| PROFIT | | | 29 | 58 |
| LOSS | | | | |
| COST PER LB. | | | | |

*Fig. 6.—Cost Card. (Size 3½ x 5½ Inches.)*

be the same on each job. For instance, the time spent in the office and by the superintendent looking after a job amounting to $50 may be just as much as is spent on a job amounting to $500, so that the operating expense on the $50 job would be more in proportion than on the $500 job, but we know of no way of equalizing this, so we are content for the present to charge each job with this fixed percentage for operating expense. We are not ourselves thoroughly satisfied with this way of doing, and are always looking for some method of improvement.

## THE SARATOGA CONVENTIONS.

THE GRAND UNION HOTEL has been selected as headquarters for the joint convention of the Southern Hardware Jobbers' Association and American Hardware Manufacturers' Association at Saratoga Springs July 14 to 17 next. The Grand Union is Saratoga's largest and best known hotel, and supplies in an ample degree all the accommodations in the way of public rooms, &c., desirable for a large convention. The Grand Union management have granted reduced rates for the gathering, as has also Congress Hall, which is just opposite the Grand Union. There will undoubtedly be a good representation of the trade at both these hotels.

JOSEPH GILLOTT & SONS, Birmingham, England, announce that the long connection of Henry Hoe as agent for the sale of their Steel Pens in the United States was terminated on the 30th ult. Hereafter the sale of these Pens will be in the hands of Alfred Field & Co., 93 Chambers street, New York, who have been appointed sole agents in this country, beginning May 1.

## PRICE-LISTS, CIRCULARS, &c.

WILCOX MFG. COMPANY, Aurora, Ill.: Grindstone Catalogue, which is a pamphlet of 16 pages, containing illustrations and full description of their line of Ball Bearing Grindstones, Fixtures, &c. Special attention is called to the Wilcox Ball Bearing Grindstone Journal which is used on all mounted Grindstones made by this company, with the exception of their Nos. 08 and 09, and is also furnished with each set of Grindstone Fixtures. The company state that they control large quarries in what is known as the Berea district in Ohio, and are prepared to furnish Grindstones of any desired grit, size or quantity.

RICHARDS MFG. COMPANY, INC., Aurora, Ill.: Catalogue and price-list of Door Hangers and Hardware Specialties. The company are now manufacturing quite a full line of Hangers, both for barn and house doors, there being ten different varieties of the former and 18 of the latter given in the catalogue, with four different kinds of rail. Prominent among the miscellaneous articles are Fire Door Fixtures, Hangers and Fusible Links. The company are also placing upon the market Bar and Corner Irons, Door Pulls, Extension Bolts, Ball Bearing Store Ladder and Fixtures, Mending Iron, Spring Hinges, Stay Rollers and Trolley Tracks. The company introduce their catalogue with an announcement of the arrangements made with the Richards & Sencenbaugh Mfg. Company some time since, reference to which has already been made in our columns.

THE L. S. STARRETT COMPANY, Athol, Mass.; Catalogue No. 17. In addition to new tools, many changes have been made in the company's former line, and fully two-thirds of the illustrations are entirely new. Among the changes and improvements in the line of tools, attention is directed to Rules, Straight Edges, Steel Tapes with leather cases, Combination Squares, Micrometers, Surface Speed Attachments, Wire Gauges, &c.

ACORN BRASS MFG. COMPANY, Chicago, Ill.; Illustrated catalogue descriptive of the Wonderful Doran Light. This shows various forms and styles of hydrocarbon Lights and the uses to which they may be put.

R. S. CAWARD, Cresco, Iowa: The Improved Faultless Grubbing Machine and Stump Puller. A catalogue illustrates and explains the Puller, with testimonials as to its efficiency.

MILWAUKEE TACK COMPANY, Milwaukee, Wis.: Illustrated catalogue and price-list devoted to Cut and Wire Tacks, Nails, Staples, Rivets, &c.

P. J. CONROY, Seventy-fifth street and Island road, Philadelphia, Pa.: The Conroy Refrigerator Door Fasteners and Locks. An illustrated catalogue and price-list relates to Door Fasteners and Locks, Refrigerator Hinges, Refrigerator and Cooler Faucets, Ice House Levers, Bolt Caps, Brass Hinges, Door Pulls, Hand Rail Holders and Brackets, &c.

BORSUM BROS., 202 Fulton street, New York: Catalogue of Metal and Glass Polishes imported and manufactured by the firm. Illustrations in colors indicate the styles of packages in which these goods are put up.

LOOBY & FARGO, Centerbrook, Conn.: Catalogue and price-list illustrating Brushes for cleaning glassware, milk bottles, water closets, firearms; also cotton mops.

MILNE MFG. COMPANY, Monmouth, Ill.: Illustrated catalogue devoted to Grub and Stump Machines, Wire Rope Couplers and other appliances for clearing timber land.

J. G. BRAUN, 322-328 South Paulina street, Chicago, Ill.; New York branch, 554 West Thirty-sixth street: 1903 illustrated Catalogue No. 8 of 104 pages, each 17¾ x 12½ inches, illustrating large assortments of Plain and Ornamental Wrought Iron Moldings, Sash, Angle, T and U Iron; also Square Tubings for elevator fronts, &c. All Moldings can be had on special order in copper, brass and aluminum. They likewise carry complete stocks of Hand Made and Pressed Ornaments, Rosettes, Leaves and Wreaths and Drop Forged Pickets and Rivets. The house also have a branch in San Francisco.

# THE TRAVELING SALESMAN HIS METHODS AND CONTROL

BY SAMUEL MASTERS.

## CHAPTER XVII.—SAMPLES.

A JOBBER'S salesman should never be permitted to travel without samples. There is in every large force a man or two who thinks that his catalogue and list of prices give him all the information and support he needs, and who dislikes to be burdened with a sample trunk. It is hard to keep these men strictly in line, but it will richly repay the effort if every salesman can be made to carry and show to the trade upon each of his visits a carefully selected assortment of samples representing the profitable and seasonable goods in the line. The character of the sales shows plainly which of the salesmen make a proper use of their samples and demonstrates their value as nothing else can.

### New Goods.

Occasionally every jobber will add to his line a new article which promises to be a good seller, and furnishes his salesmen with samples. As a rule orders are frequent for the next month or two—until the men have covered their territory once—and then they often stop suddenly and never resume. The salesmen have taken the samples over their routes and showed them, taking orders where they could. The next trip the samples are left at home. The dealers who bought on the last trip have a stock on hand, and those who did not buy before will not do so now with nothing to recommend them but the salesman's word, pictures and a hazy recollection of their appearance as seen a month before. The chances are that the most of the salesmen will not again take the samples out with them unless the jobber specifically demands it, and many an article which might have been a winner if properly handled has a scanty sale because the salesman will not persistently show his samples.

### Value of Repeated Showing.

One showing is by no means sufficient for very many new things—particularly those which are decided innovations. Very many times an article which performs some new function or is a decided departure from anything else sold, needs several presentations before its value is recognized. The first time or two that the dealer sees it are fruitless so far as orders are concerned, but he is becoming accustomed to it and brought to a condition where he sees the merits of the article and can be induced to buy.

### Creating a Market.

One of the greatest complaints which the progressive manufacturer has to make concerning the jobber is the lack of ability to create trade along new lines. No matter how good a thing may be, if it is decidedly new the manufacturer must create the demand before the jobber thinks he can handle it; yet when the demand is created and orders come with comparative ease, the jobber insists that the manufacturer shall keep away from the retailer and abandon the trade he has spent time and money to cultivate. Sometimes this is cheerfully done if the manufacturer has from the beginning intended to simply do missionary work for the jobber, but in very many cases he holds onto his best retail customers and the jobber sets up the old cry that the manufacturer is seeking to sell both him and his customer.

Now it is true that the jobbers' line is too large and varied to permit him to spend a great deal of his time in exploiting new articles, but it is also true that the salesman who has each time a few new things of decided merit to offer can win the buyer's favor when the one who sticks to staples cannot gain a hearing. The man who has something new to offer each time finds it easier to get the buyer to look at his line of samples and the examination usually does not stop at the novelties.

### Samples of Staples.

There are many goods which are standard in the trade which have long formed a part of the jobber's line and are illustrated in his catalogue, but which should be occasionally shown by sample. Perhaps half of the salesman's customers have the goods on their shelves and he can safely assume that the most of the others are familiar with their general appearance and characteristics, but even in such conditions orders come more freely and new customers for the goods can be easier made with a sample in hand.

### Salesmen's Treatment of Samples.

As a rule, samples of General Hardware are expressed to salesmen at their home addresses, and the men left to add them to the contents of the sample trunks, laying aside such other of the older samples as they see fit. This is well enough so far as it goes, but the jobber who does not require salesmen to occasionally bring sample trunks into the house for revision will have a painful surprise if he will make an experiment in this direction. He will find that the trunks do not contain what he thinks have been carried, and often that the samples have been abused and very poorly show forth the line. The houses that handle Cutlery make up sample rolls and attend to their revision, and the Cutlery clerks will testify that in many cases samples are missing and rolls disgracefully cared for, and it is only fair to presume that the men who thus abuse their finest goods, which are sold solely from sample, will have even less regard for the miscellaneous articles, the sampling of which is largely optional with them, and which they regard of minor importance. To prove this, let a jobber who has not been wont to closely supervise the use of samples wire a salesman whose orders show a lack of specialties to send in the trunk he has on the road with him, and then compare the actual and the ideal conditions. The outfits of even his most conscientious men will show a discrepancy without this occasional supervision.

### Samples Charged to Salesmen.

The jobber should be as liberal in his charges against salesmen for samples as he is strict in his demands that they be shown. As a rule, when samples are issued a memorandum charge is made of the same and each salesman is held to strict account, for it requires somewhat of an investment to thus equip a traveling force. In theory this is correct, but every salesman who has ever carried the large and varied assortment that constitutes a Hardware jobber's samples has lost some, broken others and had still others stolen. The most careful salesman will occasionally find a Pocket Knife disappear from his roll, and the tests to which customers put some of the samples ruin them. The jobber can well afford to be lenient with salesmen whose losses are moderate. Sample accounts should be revised at intervals and kept straight, for it is most unfair to call a salesman to account for samples issued over a year before, of which no mention has since been made. It is doubly unjust if a salesman is leaving a jobber's employ, if a long neglected sample account is brought forward at the time of final reckoning and deduction in full for missing samples made—yet this is sometimes done.

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THE LIBERTY CHUCK & WRENCH COMPANY have been organized under New Jersey laws, with an authorized capital of $125,000. They have purchased the property of the Doebler Mfg. Company, in Middletown, Conn., and are now making improvements in it preparatory to the opening up of their business. The company own a number of patents in Pipe Wrenches, Drill Chucks and Steel Mats. They also own the patents and machinery of the Rochester Steel Mat Company, and are operating this part of the business at their factory in Union Hill, N. J. It is their intention to move this business to the Middletown factory as soon as practicable. The Liberty Pipe Wrench, which they propose to have ready for the market at a very early date, is said to be an article of great merit. The officers of the company are C. Frank Doebler, president; John G. Doebler, secretary, and Lloyd R. Atkins, treasurer. The factory at Middletown is about 200 feet long, 25 feet wide, two and one-half stories high and is in excellent condition.

# BRITISH LETTER.

Offices of *The Iron Age*, HASTINGS HOUSE, NORFOLK ST., LONDON, W. C., May 2, 1903.

### The Week's Hardware Trade.

PROMISES of good trade are still profuse, but their performance lags. Trade in the Light Hardware sections is far from good, and the outlook is not roseate. Expectations have by no means been fulfilled, and in the Midlands nearly everybody is agreed that trade is dull and dragging. The busiest people just now are the Rifle and Ammunition manufacturers. At Enfield the improved Lee-Enfield is being turned out in thousands. The cost of rearmament to which the British Government is now committed will exceed $10,000,000. That expenditure is shared equally between the Government arsenals and private contractors, and will probably be extended over two or three years. The new Rifle is understood to be a pound lighter and 5 inches shorter than the old one. There is more elasticity in the tin plate trade, and there is a good demand for Nuts and Bolts, Iron Hurdles and Gates. The tube trade shows same slight improvement, but is still unhappy. The Cutlery trade shows some improvement with Australia. All last year, owing to the drought and other causes, business grew worse, and has recently been extremely quiet. By the last three mails, however, good lines have reached Sheffield, together with happier reports as to the commercial conditions of Australia. At the ivory sales in London this week 69½ tons were offered, but the sales were the smallest for 15 years, with the exception of last year. The stock in the docks is now 102 tons, or 20 tons more than last year or the year before. Hard teeth averaged £2 per hundredweight advance, and small teeth were very firm. At the Antwerp sales next week 93 tons will be offered. It is evident that the Antwerp sales are now the really important factor in the ivory trade.

On overseas account trade is moderate. The South American improvement continues, and for reasons already stated there is some hope that increased orders will come from Canada.

### Preferential Rates in South Africa.

Bills will be introduced into the Cape and Natal Legislatures at the close of May or the beginning of June, to ratify the resolutions for a preferential treatment in South Africa of the goods and products of the mother country, recently adopted at the Bloemfontein convention. Sir Gordon Sprigg, the Prime Minister of the Cape Parliament, explains in a letter that the resolutions do not embrace any principle of reciprocity on the part of Great Britain. "Strong views," states Sir Gordon Sprigg, in his communication, "were expressed as to the need for some reciprocal treatment being accorded by Great Britain and all the British possessions. The resolution, however, as finally adopted, only stipulated for such reciprocity on the part of other colonies desirous of participating in these special advantages."

### Going to the Seaboard.

I have mentioned two or three instances during the last 12 months of iron manufacturers and merchants who are compelled to journey to the seaboard on account of excessive inland freight rates. A rumor is going round that Bayliss, Jones & Bayliss, Limited, the well-known iron manufacturers of Wolverhampton, are negotiating for a site near Newport on the South Wales coast. Nothing definite can be stated, but sooner or later I think the transfer of the works will take place. An indication of this will be found in the proceedings of the District Council in South Wales, where a letter was read from Bayliss, Jones & Bayliss, asking for the basis of rating in the parish. This being supplied the firm wrote to the council asking if they could guarantee that the rates would not be increased more than 5 shillings in the pound, including poor rate, for the next 15 years. The council replied that they could not commit themselves to anything, but that they did not anticipate any increase. The letter throws a flash light upon the difficulties of rating and taxation which at the present time hamper British manufacturers.

### Commercial Travelers' Luggage in Russia.

I hear that the Russian Government proposes at an early date to introduce a system by which commercial samples and the luggage of commercial travelers may be transmitted throughout the Czar's Empire at exceptionally cheap rates. The decree it is understood has already been prepared, and will probably be promulgated directly the new arrangements requisite for carrying it into effect are completed.

### Markets in Southwest China.

Information continually accrues to prove the increased possibilities of trade in Southwest China. In addition to previous comments I have made upon this district, I am glad to note some interesting particulars in a letter from Hongkong dated March 21. This letter, sent to Glasgow, says in part:

Without entering into details of the various occasions on which advantage was taken of current circumstances to extend the openings for trade in the region, it may be said that the following places are now open to foreign trade, and possess Chinese Customs stations under foreign officers, as well as British or French Consuls, and sometimes both. Going eastward, we find, first, Tengyueh, or Momein, which was a familiar word in our ears in 1876-8 in connection with the murder of Mr. Margary and the Grosvenor mission of investigation. It is the first trade mart in Yunnan, on the route from Bhamo in Upper Burma to the cities of Tali and Yunnan. It lies on what has been called for centuries the Golden or the Ambassadors' Road from Burma into China. Next comes Szemao, also in Yunnan, but on the borders of the Shan States and close to the Meikong, on an ancient caravan road (which is still busy with traffic) from Yunnan through the Shan States into Mandalay and Southern Burma. Both of these places were opened by conventions with the British. Going eastward along the border we next come to Mengtsze, still in Yunnan, at the head of the navigation of the Red River of Tonquin, and now admitted to be in an excellent situation as a railway center for Yunnan from Tonquin. Next comes Lungchow, in Kwangsi province, also on the Tonquin border. Both of these were opened by agreement with the French. Lastly come the towns and places on the West River of Canton, at which foreign steamers may land and ship cargo, and where foreign merchants may reside. These are now numerous along the stream from Samshui, near Canton, up to Nanning, not far from the Yunnan border, and have been opened under two conventions with Great Britain.

### Burma's Increased Trade With Western China.

The whole trade of Burma with Western China is growing, in consequence of improvements made on the roads and bridges on the route between Bhamo and Momein, the abolition of all sorts of tolls levied by the Kachin tribes, and, above all, by the reduction to peace and order of the tribes on both sides of the border. At Bhamo, during the winter, which is the busy season, trade to and from China is most active, caravans, consisting of hundreds of mules, laden with Western manufactures and Yunnan produce, going and coming daily. One drawback to trade with Burma, which is not likely to be removed, is that opium, one of the most valuable products of Western Yunnan, is not admitted to the province, where opium, save for medical purposes, is contraband. There are two other routes from Burma to Momein besides the Golden Road, and both appear to be used to some extent. Nor can there be any doubt that the rapid growth of communications in Burma will increase the trade across the border from Bhamo, or that until the days of railways in Yunnan arrive the chief trade of Western Yunnan will take this route. At Szemao, although the volume of trade is small compared with what travelers of 20 years ago led the world to expect, there is substantial improvement, largely owing to the peace and order now maintained on the British and French sides of the frontier. Szemao is the center of the trade in the famous Pueah tea, the cultivation of which is extending. It is sent by caravans all over the Chinese Empire. The same is the case with certain kinds of cotton goods, locally woven from cotton grown in British territory, while salt is another important export. The place is also a center for the caravan trade from the chief cities of Yunnan down to the Shan States, and so into Burma and Siam.

### Annual Caravan Journeys.

Large bodies of traders start on these journeys, which last about a year, and trade all along the route, buying here and selling or exchanging there, and always returning from Zimme, in Northern Siam, or Mandalay or Moul-

mein, in Burma, with loads of foreign goods. The caravan starts, say, from Tali, in Yunnan, with felt, raw silk, straw hats, wax, china ware, &c., and sells it all on the way to or in Szemao, where it again loads with salt, Iron, Iron Pans, &c., which is exchanges en route for tea, which is sold in Zimme or Burma, where European goods are loaded for the return journey, on which the process is repeated. The drawback to trade here is bad communication, but the roads are being improved and the bridges repaired. At Mengtsze trade with Eastern Yunnan has progressed by leaps and bounds, and in 1901 amounted to over £1,000,000 in value. This is due to the improvements wrought by the French in the navigation of the Red River, the removal of obstacles and the destruction of the pirates who infested the stream. European goods go up and Tin and opium come down. The opium is consumed in Tonquin and Annam, but with this exception the whole trade of Mengtsze is with Hongkong, and is British. As soon as the French have completed the railway which they are constructing up the Red River Valley this trade will, of course, increase largely, but at the present time it does not come into competition with the trade through Burma, for it is carried on with a totally different part of the great province of Yunnan. As for Lungchow, in Kwangsi, there never has been any foreign trade there, although the French have constructed a railway to the place. The only trade is a paltry local barter across the border, aniseed being the chief staple.

### Canada and Germany.

British exporters are not slow to seize upon the opportunity offered by the Canadian-German *imbroglio* to increase their trade with Canada. Among the goods sent by Germany to Canada last year I note the following:

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| Brass and its manufactures | $11,000 |
| Cutlery | 141,000 |
| Ingots, Billets, &c. | 157,000 |
| Sheet Iron, all sorts | 5,165 |
| Machinery | 31,000 |
| Rolled Iron Bars, Girders, &c. | 55,000 |
| Tubing | 43,000 |
| Wire | 28,000 |
| Steel Plates | 42,000 |
| Tools | 19,000 |
| Lead and its manufactures | 9,000 |
| Tin and its manufactures | 6,000 |
| Other Iron and Steel Goods | 525,000 |
| Other miscellaneous metal goods | 44,000 |

Germany sent last year to Canada $1,250,000 worth of goods, most of which can be supplied by Great Britain. For that matter, they can also be supplied by America.

### The Examination Scheme.

Some time ago your readers may remember I gave particulars of a proposed scheme to examine Hardware clerks, and to issue certificates upon the basis of such examination. At the annual meeting of the Ironmongers' Federated Association, held in Sheffield this week, the whole subject was discussed with great vigor and completeness. The final result led to the examination rules being framed as follows:

1. That the I. F. A. institute a system of examination in general, tecnical and commercial knowledge, and grant certificates of competence to apprentices who have served not less than three years in the business of a recognized Ironmonger or Hardwareman, and to assistants who produce evidence of having been engaged in the hardware trade for not less than four years, such certificates to bear the signatures of the Board of Examiners, the president and secretary for the time being of the I. F. A.

2. Candidates must make application for examination to the secretary of the I. F. A. at least one calendar month before the date fixed for the examination, and pay the fee of ——. In case the candidate fails to satisfy the examiners he may be re-examined at any examination held within 12 months on further payment of a fee of ——.

3. The expensese of the examining board and expenses incurred by the local secretary to be paid out of the candidates' fees.

4. An examination will be held every six months at the following centres in rotation: Birmingham, Bristol, London, Manchester and Newcastle.

N. B.—The examination committee may decline to hold an examination if fewer than ten applications are received by the secretary.

6. The Board of Examiners shall consist of gentlemen elected by the Central Board of the I. F. A. Three members to act as Examining Board at each center.

5. Fourteen days before the date of the examination a local secretary shall be appointed at the center at which the examination is to be held, with power to incur expenses in providing a suitable room and accommodation for the examination.

7. The examination shall consist of written answers to questions set on paper, for which three hours shall be allowed (say 10 a.m. to 1 p.m.), and a *viva voce* examination (commencing at 2 p.m.), in which the three examiners shall put questions to each candidate, which questions shall include the method of serving at the counter, ticket writing, stock keeping, window dressing and general aptitude as a salesman.

8. The local association secretary shall be requested himself to superintend the written examination or appoint a suitable deputy.

9. Certificates granted will certify a general knowledge of the principles of Ironmongery, but provision will be made for engrossing on the certificate special subjects, such as electricity, plumbing, electric lighting, building construction, mechanical drawing, bookkeeping, &c. Eighty per cent. of total possible marks to entitle the candidate to a first-class certificate with honors only. Sixty per cent. to a second class pass. All candidates will be required to obtain at least 50 per cent. of total possible marks in the compulsory subjects. Candidates should bring for exhibition to the examiners any certificates they may hold from the City and Guilds of London Institute, Science and Art Department, or other recognized examining bodies.

### The Saw Trade and American Competition.

At the same conference J. N. Greenall, an ex-president of the Ironmongers' Federated Association, and who last year visited America, had something to say upon the British Saw trade and American competition. He told his hearers that he had had the opportunity of going through one of the largest Saw works in America, and was told that they had several months' work in hand, and also that the firm's English trade was constantly making progress. He often wondered what the reason for this could be. He had seen it stated in a letter that the writer saw a purchaser in the Transvaal prefer an American Saw to one from Sheffield, notwithstanding that the cost was 14 pence more. He was strongly of opinion at the present time, when the cost of labor and production in America was so high, the British manufacturer should be able to hold his own in his own country. If he could not do this to-day he was afraid they would suffer when the American "boom" passed away, when their protective tariffs were removed, and the cost of American labor fell to its natural level. The American people possess plenty of natural energy; they believe that a man is born in order to make money, their works are up to date, their railway rates are lower than ours, and when they find it necessary to obtain fresh markets we must be prepared to face a keener competition than ever before.

## AUSTRALIAN LETTER.

MELBOURNE, April 12, 1903.

WHEN *The Iron Age* starts to gather up its news from the men of all the earth, its most welcome correspondents will undoubtedly be those who are fortunate in being located in a country whose necessities will enable them to say: "Here is a chance to adopt American methods." Your Australian scribe feels his task onerous, in having to make the most of a bad position, practically to record the wearisome routine of "marking time." The effect of the position foreshadowed in former letters is now beginning to make itself felt, and by the end of 1903 this paper will have to record severe contraction in Australian imports and exports.

### Effect of Short Crops.

The effect of the short crops is already noticeable in the trade returns just issued for the first two months of the present year in this State of Victoria alone. Exports of wool for this period show a drop on last year's corresponding months of £122,000, and of £560,000 as compared with 1901. Wheat and flour exported were £185,000, as compared with £410,000 last year. This, of course, is purely the result of the drought. So far as Victoria is concerned, we have some reason for hoping the drought is over, but New South Wales and Queens-

land are no further forward as yet in the matter of rainfall.

There has been rain in North Queensland, but it came accompanied by a hurricane which nearly blew Townsville off the map, doing £200,000 worth of damage in that town alone.

### Merchants and Agents.

*Australasian Hardware*, published at Melbourne, has recently devoted considerable space to the much vexed question of harmonious working between British manufacturers and their Australian agents. Boiled down, the arguments resolve themselves into the facts and statements which appeared in *The Iron Age* some few years ago under the title, "Working Up an Australian Trade." The first requirement is that the manufacturer, whether American or British, shall come and see the ground. That should cover the whole field of requirement, if backed up by a steady determination to keep the agent promptly posted in all changes of prices and discounts, to work out all new patterns submitted as being of special value to a special market, and to see that the field is well supplied with advertising matter. Printers' ink is no small factor in the necessities of the case. American manufacturers should bear in mind the way they have captured the Australian field in such lines as Lamps and Axes, as an object lesson of success. And they are reaching out well for Builders' Hardware, although here they have far more competition to meet.

### Locomotives for Victorian Railways.

Since my last advice of the forthcoming tenders for 39 locomotives, it has been decided by the Ministry in power to restrict tenders to Australian firms. On present indications it appears to be the intention of the Ministry to have the engines built at the railway workshops—that is, by the State—and outside firms are complaining that they cannot possibly hope to tender successfully against State-managed competition.

### Melbourne Notes.

The will of the late Edward Duckett of Londsale street, Melbourne, Hardware merchant, has been proved for £212,000. The money has been left to his family, and the Hardware business will be carried on by his four sons.

W. & A. Bennett & Son, wholesale ironmongers, of Melbourne, have withdrawn their country travelers. A sign of the times. Another large Melbourne firm are reputed to be fast losing their hold on town and suburban business. To say why might be libelous.

### Tariff Changes.

Recent customs decisions likely to affect American Hardware exporters to Australia are: Hand Tobacco Cutters, 12½ per cent. Pewter in sheets, 20 per cent. Steel Tires for locomotive engines and tenders, 12½ per cent. Sewing Machine Accessories: Cans for lubricating, 20 per cent.; instruction books, free; leather belting in the piece, 20 per cent.; one belt to be admitted free with each machine, if accompanying same. Steam Vehicles for road carriage, 20 per cent. "Spike Willey" or "Devil" (a machine for teasing and cleaning wool), 12½ per cent. Smoothing Iron Handles (wood or iron), free. Press Drawing and Deepening Double Action Machines for producting tops and bottoms of cans, 12½ per cent. Exhaust Fans for mines, free. Counter Scales, 20 per cent. Chemical, Analytical and Assay Scales, free.

The following parts of articles will be admitted free, with a view to encouraging home manufacture, this policy assisting the Australian producer:

Manufactures of metals—viz.: Agricultural, Horticultural and Viticultural Implements—Cheek bits and mouth pieces for Chaff Cutters; fingers and sections for Reapers; rail ball knobs or buttons for Bedsteads; stamped and spun mounts for Bedsteads—viz.: Vases, tops, husks, middles, spindles (including china, pearl, porcelain, glass, onyx), and ends, tees, caps, tips, roses and rosettes; shields, bottom mounts, ball tees, rod and terminal ends, ferrules; vases, spun or stamped, for Fenders.

Manufacture of Vehicles.—Anti-rattlers (except india rubber), bands, nave (except plated and mixed metal), bar mountings, back lights, buckles and buckle loops, barrels, curtain, beading and bead finishers, bow sockets, burrs (iron), buttons, clips, collars, conductors (water), couplings, shaft and pole, ends, eyes; fasteners, apron, curtain, seat and patch; hinges, concealed and butt; joints, concealed; irons, slat; ivories; joints, stump; knobs; lace, broad, seaming and pasting; malleable cast hubs used in the manufacture of children's cycles and perambulators; plates, felloe; props or nuts for tops or hoods; shackles; slide, seat; staples, breeching; steps and step treads; stops, shaft; tassels, tips, whip sockets.

CONTENTS.

## THE STANDARD PAINT COMPANY.

ON the 22d ult. the Standard Paint Company, manufacturers of the well-known Ruberoid Roofing and P. and B. products, tendered to their employees a house warming in celebration of the completion of their new factory at Bound Brook, N. J. There were present some 600 people, including the employees of the company and their friends and relatives. They danced until the small hours, being in the meantime regaled with plentiful refreshments in an immense room some 375 feet long, on the third floor of the new building. The president of the company, Ralph L. Shainwald, was present and received many congratulations upon the success of the company as evidenced by the necessity for the new plant.

The Standard Paint Company were organized in 1886. The first factory was erected at Bound Brook, N. J., on a part of the site of the present works. A portion of the factory at the beginning consisted of a frame building which had formerly been used as a planing mill. This building has long since disappeared, and the site is now occupied by a brick and iron structure, forming a part of the present mills. The demand for their product has grown steadily, and extensions of the plant and purchases of additional land have been continuously necessary from the beginning. As an evidence of the expansion of the business it may be said that there has not been a time during the past five years when the company have not been behind their orders. Within the last two years the pressure upon the manufacturing facilities has been so great that the company were obliged to consider doubling their capacity. The result was the purchase of an additional large tract of land with the buildings thereon and the erection of the largest new building which the company have yet added to their plant. Extensions previous to the present additions were at the time considered sufficient to cope with even a larger increase in business than could reasonably be looked for, but, although two forces of men have been kept working night and day, with engines working 23 hours out of every 24, it has been found impossible to meet demands as promptly as desired. At the time of the last additions the Paint and Varnish plant of the company was transferred to new property then purchased, and the original site devoted to the manufacture of Ruberoid Roofing and Giant and other insulating papers. To the present Roofing and Paper plant has been added a three-story brick and iron building, 375 feet in length. As the factory now stands, a building some 500 feet in length will be devoted entirely to the manufacture of Ruberoid Roofing.

A pleasing feature of the company's general organization is the loyalty which has been evinced by their employees. The company, through their president, have always made it a point to encourage this feature by making permanent the positions of men who have been faithful to their interests. Among the employees there is a Mutual Benefit Insurance Association for the sick and disabled. To this association the company contribute annually an amount equal to the total contributed by the men. Another unique feature is the fact that quite a number of the employees of the company are shareholders. This policy of mutual interest has also been encouraged by the company among their men.

## DUNHAM, CARRIGAN & HAYDEN COMPANY'S SEATTLE HOUSE.

DUNHAM, CARRIGAN & HAYDEN COMPANY, San Francisco, Cal., have recently, through the vice-president of the company, Andrew Carrigan, secured a majority interest in the Engineers' Supply Company, Seattle, Wash. It is their intention to erect soon on a suitable site, on the tide flats in that city, a large warehouse for carrying an adequate stock of Heavy Hardware. The following officers of the Engineers' Supply Company were elected: Andrew Carrigan, president; J. S. Egan, vice-president; Geo. N. Gilson, secretary. The business in Engineers' Supplies will be retained under the corporate name of the Engineers' Supply Company. The business of the warehouse in Heavy Hardware will be conducted under the name of Dunham, Carrigan & Hayden Company. It is not the company's intention to establish a general Hardware store in Seattle, as that business, they state, can be better handled from San Francisco, but the Engineers' Supply line requires immediate delivery, which necessitates a stock on the spot. It is not the desire to start new competition; but rather the taking over of the business of a concern already organized, and working harmoniously with the other coast houses in the same lines of trade.

## MINNESOTA RETAIL HARDWARE DEALERS' MUTUAL FIRE INSURANCE COMPANY.

THE MINNESOTA RETAIL HARWARE DEALERS' MUTUAL FIRE INSURANCE COMPANY, of which M. S. Mathews is secretary, 323 Boston Block, Minneapolis, Minn., have issued an interesting little pamphlet in which information is supplied in regard to the company, their methods, advantages, &c. This company, as the trade generally are aware, confine their operations entirely to the retail Hardware business, and were established by the Hardware association in Minnesota for the benefit of their members. The company are now, however, extending the privilege of insurance to retail dealers in other States who are members of Hardware associations. The company's policies are written for one year, at the expiration of which time the insured knows just how much this mutual plan has saved him in the cost of his insurance. Under this plan each year's business takes care of itself, the return premiums being based upon the losses and expenses incurred during that year. This premium is returned to the insured if he does not wish to continue another year, or is credited to him upon renewal of his policy. The premium thus refunded is estimated at 35 to 40 per cent. The charge for insurance is the established board rate for the town, or if none is established the rate is made the same as that asked by any reliable company. No policy is written for less than $500, or for more than $3000. The company state that their losses are promptly paid when adjusted, with no discounts demanded at settlement, and every policy holder is fully protected and absolutely indemnified by the Minnesota policy which they issue.

## NORVELL-SHAPLEIGH HARDWARE COMPANY.

THE NORVELL-SHAPLEIGH HARDWARE COMPANY, St. Louis, who were incorporated on July 1, 1901, with a capital of $1,000,000, owing to the large increase in their business have found it necessary to add to the capital. The company, therefore, issued $500,000 of 6 per cent. preferred stock, dividends payable quarterly. This stock was all taken, we are advised, within three days after it was offered, no commissions of any kind being paid, and the entire amount in cash being placed in the treasury of the company. This increase will give them ample working capital for the needs of their business. The company are devoting special attention to the care of small orders that are sent to them by mail direct from their customers between the visits of their salesmen. They are shipping a large proportion of these orders the day they are received, and are pricing them with great care, fully realizing that prompt service, the complete filling of orders and the right prices are the only means by which a large and permanent mail order business can be built up. They report a very satisfactory increase in trade of this character following the wide distribution of their new General Hardware catalogue in the last thirty days. Their model retail Hardware store continues to attract the attention of visiting merchants. This store is arranged with Warren's Patented Shelving, and the various lines, including Cutlery, Sporting Goods, Builders' and Shelf Hardware, Paints, Brushes, &c., are all completely sampled. The store is 22 x 45 feet in dimensions, and is located on the top floor of the building, where splendid light is secured by the use of skylights.

Jos. Karl has disposed of his Hardware, Stove, Farm Implement and Sporting Goods business in New Prague, Minn., to Sachs & Rynda.

## A LUMBER CAMP WINDOW DISPLAY.

THE accompanying illustrations represent a window display made by C. E. Park & Co., Flushing, Mich. Red bunting was used as a background for the scene, upon which were arranged Cross Cut Saws, Axes, Saw and Axe Handles and Files. The snow effect was produced by the use of cotton batting, with small pine sprouts to represent trees. At the right-hand side of the rear of

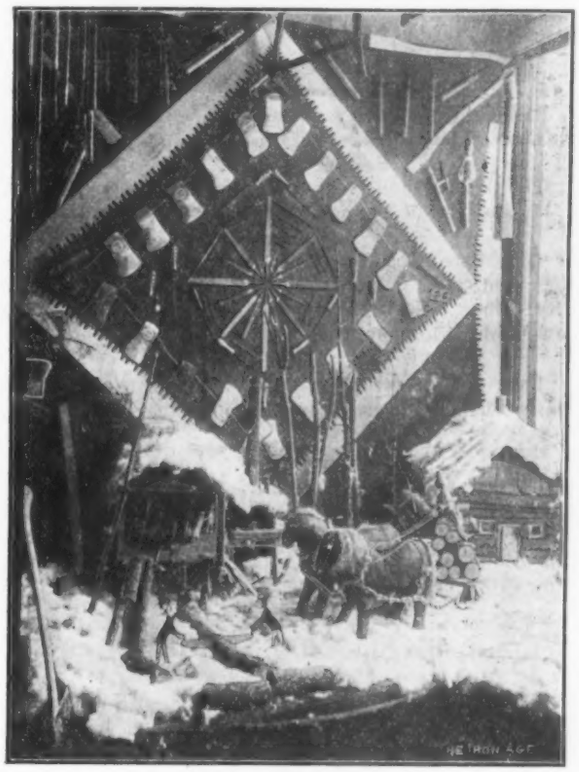


*Fig. 1.—Lumber Camp Window Display.*

the window was a log cabin, or men's quarters, and on the opposite side was a saw mill with machinery. The saw was made of tin and the saw carriage of wood with small Shutter Knobs for wheels. On the carriage was placed a small log, partly sawed, and near by was a man tending the saw. The whole was run by clock work, as follows: A cord belt was run from one of the clock wheels to a pulley attached to the saw. A pitman attached to the hand post with a crank and connected with the log carriage moved it back and forth past the saw. In front of the mill two men were cutting logs with a Cross Cut Saw, and near the center was a team with a load of logs. The latter are shown more distinctly in

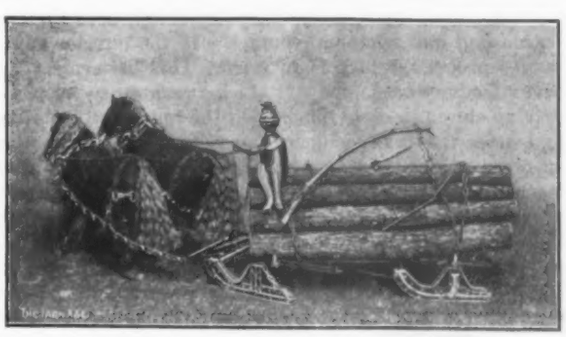


*Fig. 2.—Horses and Sled.*

Fig. 2. The sled was made of wood of the same pattern as regular lumber sleds. The horses were made over forms and covered with black cloth. Unraveled rope served for manes and tails. The harness was made of Harness Snaps and Jack Chain. The driver was composed of a Copper Oil Can for a body, Tea Pot Spouts for legs and a Stove Door Knob for a head. The window was planned and arranged by C. P. Cates, one of the firm's employees. It attracted a great deal of attention and was greatly admired.

## TRADE ITEMS.

WILLIAM W. SUPPLEE, president of the Supplee Hardware Company, Philadelphia, and ex-president of the National Hardware Association, was recently elected vice-president of the Corn Exchange National Bank, one of the leading financial institutions of the city.

AT a special meeting of the directors of the Meriden Cutlery Company, Meriden, Conn., held on the 6th inst., Homer A. Curtiss, formerly secretary, was elected president, to fill the vacancy caused by the death of Aaron L. Collins. Treasurer George M. Howell was elected secretary and Edward J. Collins, son of the late president of the company, was elected a director.

THE KANSAS CITY IMPLEMENT, VEHICLE & HARDWARE CLUB held its last monthly meeting before the summer adjournment at the Coates House, Kansas City, May 4. The early part of the evening was spent in a social way, after which several matters of interest to the club were discussed. A resolution was passed recommending that the new Union depot be located in the West Bottoms, and the secretary was instructed to present the matter to those having the project in charge. Meetings will be resumed in October.

## REQUESTS FOR CATALOGUES, &c.

*The trade are given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.*

REQUESTS *for catalogues, price-lists, quotations, &c., have been received from the following houses:*

FROM BALTIMORE HARDWARE COMPANY, Baltimore, Md. They have just taken possession of their new store, which is said to be twice as large as the former quarters. They are expecting to add a line of House Furnishing Goods to their former stock and desire catalogues and other printed matter relative to this department of trade.

FROM HUTCHINGS HARDWARE COMPANY, who have succeeded Hutchings-Talmage Hardware Company at San Marcos, Texas, in the wholesale and retail Shelf and Heavy Hardware, Stove, Tinware, Agricultural Implement, Sporting Goods, Paint and Oil, House Furnishing Goods and Plumbers' Supply business.

FROM DE BELL BROS., who have lately commenced business at Falconer, N. Y. They are handling a general line of Hardware, as well as Stoves and Tinware, and also have a plumbing and tin shop.

FROM OSWALD HARDWARE COMPANY, who have succeeded the Smith Hardware Company, Blakesburg, Iowa.

FROM E. H. RAWLS, who has purchased the business of C. Roessler & Son, Charleston, S. C., dealers in Hardware, Stoves, Saddlery, House Furnishing Goods, &c., and will continue at the old stand.

FROM GUTHRIE, BRADLEY & CO., Sweetwater, Tenn., who have bought the Shelf and Heavy Hardware, Stove, Tinware, Agricultural Implement and Paint and Oil business formerly conducted by James May & Co.

FROM PEORIA COAL DRILL & HARDWARE COMPANY, who have recently organized at Peoria, Ill., to carry on the wholesale and retail business in Shelf and Builders' Hardware, Stoves, Paints and Oils, Tinware, Miners' Supplies, &c.

FROM WARREN H. LYON, who has purchased the stock of Shelf Hardware, Stoves, Tinware, Farming Implements, and Paints and Oils formerly owned by Lewis Atwater, Scipioville, N. Y.

FROM R. E. PRINCE, who has just opened a Hardware

store in Raleigh, N. C. Mr. Prince's stock comprises Shelf and Heavy Hardware, Stoves and Tinware, Paints and Oils, Sporting Goods, &c.

FROM STEUBENVILLE HARDWARE & SUPPLY COMPANY, Steubenville, Ohio, who have been incorporated, with a capital stock of $50,000, to carry on the wholesale and retail business in Shelf and Heavy Hardware, Agricultural Implements, Paints and Oils, Sporting and Athletic Goods, &c. The company are successors to W. B. Lindsay & Co. and are intending to make a number of important improvements in the establishment, which will doubtless serve to increase the volume of business.

## AMONG THE HARDWARE TRADE.

J. F. Wollenburg has bought the interest of his partners in the Hardware, Stove and Farming Implement firm of Wollenburg & Co., Beaver Dam, Wis., and will continue under his own name.

Stubbs & Jakway, Telluride, Col., have been succeeded by F. D. Work & Co., who will continue the wholesale and retail business in Shelf and Heavy Hardware, Stoves, Tinware, Farming Implements, &c. Mr. Work was formerly connected with the Tompkins-Hunt Hardware Company of Telluride.

John J. Cloos, Fremont, Neb., has been succeeded by Foote, Stone & Rogers Company in the Hardware, Stove, plumbing and heating business.

Fones Bros. Hardware Company, Little Rock, Ark., have disposed of their retail department to the City Hardware Company, who will continue to handle Shelf and Heavy Hardware, Stoves, Tinware and Agricultural Implements. Louis K. Mandlebaum, vice-president of the Arkansas Pump & Pipe Company, will manage the new concern. Possession will be given on June 1. Fones Bros. Hardware Company will continue in the wholesale business exclusively, with no change whatever in officers or employees.

Deutz Bros., Laredo, Tex., have disposed of their Hardware business to their brothers, A. and C. Deutz, who will continue under the style of A. Deutz & Bro.

O. L. Stratte, Oldham, S. D., has sold his Hardware stock, but will continue in the Farm Machinery business.

N. P. Lund has opened a new Hardware store at Oldham.

H. C. Lueth, Spencer, S. D., has sold his Hardware business at that place to John Kruse, who will conduct it in future. The purchaser of the stock is an experienced Hardwareman.

The Jim River Hardware Company, Lennox, S. D., have sold out to John Harms, Jr., and Edward Van Bockern.

McDonald Bros., Madison, S. D., have disposed of their stock of Hardware and tin shop to E. L. Kingsley.

The old firm of Huffman & Fanset, dealers in Hardware at Garden City, S. D., have dissolved. Mr. Green has purchased Mr. Huffman's interest in the business, and the style is now Fanset & Green.

Holmes & Howe is the name of a new firm who succeed Hatch, Arland & Co. in the Hardware business at Mt. Vernon, S. D. Both members of the new firm are well known to the people of Mt. Vernon and vicinity, as they were engaged in business at that place a few years ago.

Hessenius & Bunger, Hardware dealers, Davis, S. D., have completed extensive improvements in their store building.

George Small, for some years a resident of Redfield, S. D., has purchased the Hardware stock of Beebe & Miller at that place and moved it to Arlington, S. D.

Olston & Thorsnes is the name of a new firm who have purchased the Hardware store of Carlson Bros., Lake Preston, S. D.

J. W. Ryan, a pioneer Hardware dealer of Salem, S. D., has sold his stock to Dion E. Pearce, formerly of Madison, and Val Fetzner of Salem, who will conduct the business in future under the firm name of Pearce & Fetzner.

E. I. Gregory has purchased the Hardware store of J. E. Peckham, at Alexandria, S. D., and will continue the business at the old stand.

The Groton Implement & Hardware Company, Groton, S. D., have decided to add lumber to their other lines.

Hart Bros., Bradley, S. D., have sold their business block and stock of Hardware to E. D. Swanson of Grove City, Minn., who has removed to Bradley and taken possession of his purchase.

Bork & Hanson is the name of a firm who have recently engaged in the Hardware business at Bryant, S. D.

Grimes Hardware Company, Walnut Ridge, Ark., have been incorporated, with J. G. Grimes as president and A. T. Grimes, vice-president, secretary and treasurer. The company are dealers in Shelf Hardware, Stoves, Tinware, Sporting Goods, &c.

## MISCELLANEOUS NOTES.

### U. M. C. High Velocity Rifle Cartridges.

The Union Metallic Cartridge Company, Bridgeport, Conn., and 313-317 Broadway, New York, are now prepared to furnish a series of new high velocity cartridges as follows, viz.: 25-20, 32-20, 38-40 and 44-40. This group of cartridges in the calibers named are designed for use in Winchester rifles of model '92, Marlin rifles '94 and single shot rifles, but should not be used in pistols. They are furnished with soft point bullets for big game shooting and are loaded with low pressure smokeless powder, which gives high velocity and increased striking power over the regular black and smokeless cartridges of these calibers.

### Corbin's Duplex 1903 Model Coaster and Brake.

A new feature of the Corbin Duplex 1903 Model New Departure Coaster and Brake for Bicycles is the form and location in the hub of the driving clutch spring, which as now furnished tends to force the braking clutch and driving clutch apart as soon as the function of braking ceases, and into frictional contact with the interior of the hub to propel the bicycle forward. This betterment has several advantages, one of which operates to keep the driving clutch in close touch with the hub when pedaling, and after the braking operation ceases the two toothed surfaces of the driving and braking clutches are automatically separated as the back pressure is removed, thus preventing even slight contact of the toothed parts and the annoying click sometimes heard when the separation is not absolute. The spring heretofore was on the opposite side of the driving clutch, and served to produce opposite results. This Coaster and Brake is manufactured by P. & F. Corbin, 11-15 Murray street, New York.

### The Roesch Automatic Rural Delivery Mail Box.

The accompanying illustrations represent a rural delivery mail box offered by the Roesch Mfg. Company, Aurora, Ill. The box is made of 22-gauge galvanized iron. The bearings are of steel and the box is bound with 3-16-inch band iron. The box is 19 inches long, 10 inches high

and 8 inches deep, being made to accommodate the largest papers usually mailed. The inside of the box, Fig. 2, is in the shape of a half cylinder open at the top. When


*Fig. 1.—The Roesch Automatic Rural Delivery Mail Box.*

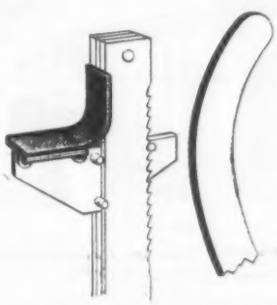
the ridge, which extends the entire length of the front of the box, is pulled down the opening is exposed for the insertion or withdrawal of mail, and remains open so long as held down. When released the back of the cylinder acts as a weight in returning it to place, the cylinder being hung off the center. When the box is opened an automatic signal drops by its own weight so as to present a surface 4 inches in diameter, which remains in view


*Fig. 2.—The Roesch Mail Box Open.*

until pushed back by the person who removes the mail or the carrier. When the signal is not in use it is under cover, so that snow or sleet cannot reach it. It is remarked that the box conforms in every way to the requirements of the Post Office Department.

## Axle Guard for Steel Jacks.

The accompanying illustration shows a neat attachment for their jacks, which is being introduced by Lane Bros. Company, Poughkeepsie, N. Y. It is a rubber axle guard mounted on a broad bearing plate, which plate has projecting lugs adapted to fit the lifting toe

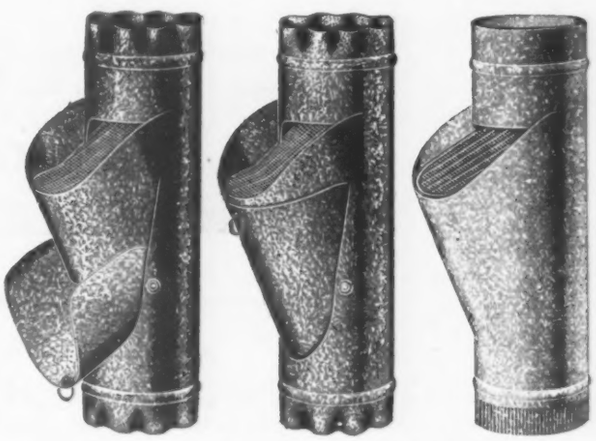


*Axle Guard for Steel Jacks.*

of the jack, to which it is fastened by a single case hardened screw. The rubber is not deteriorated by the action of water and having canvas insertion it is referred to as being quite durable. The guard can be applied in a few seconds to any Lane jack except No. 3, and prevents any metal coming in contact with the axle of a vehicle. Its universal application to jacks now in use as well as new goods is a feature to which attention is directed.

## Young's Combination Strainer and Cut Off.

The Young Mfg. Company, Bellevue, Iowa, are offering the combined strainer and cut off and strainer only, shown in the accompanying cuts, made to fit either corrugated or plain pipe. The body of the strainer is



Closed. Open. Strainer Only.

*Young's Combination Strainer and Cut Off.*

made in one piece, the various parts are soldered and riveted, and it has no levers, clamps or springs in its construction. The strainer is firmly soldered, consequently not removable, thus insuring its being in place when needed. The ribbed corrugations of the strainer are for the purpose of preventing leaves and similar matter lying flat on its surface. It is stated that the action is positive, and that the eye can readily determine in which direction the water will flow. The Young strainer is constructed on the same general lines as the combination and cut off, minus the cut off device.

## Soap Cup and Shelf for Bath Rooms.

The Searls Mfg. Company, 31 Mulberry street, Newark, N. J., have just put on the market, supplementing

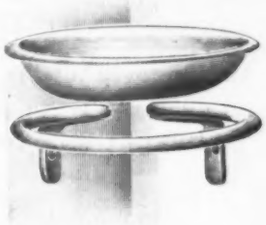


*Fig. 1.—Soap Cup for Corner.*

their extensive line of cast and wrought nickeled brass bathroom fixtures, for which Frederick Klages, 127 Duane street, New York, is the direct representative, the soap cup and shelf here shown. Fig. 1 illustrates corner

*Fig. 2.—Plate Glass Bathroom Shelf.*

soap cup No. 3613, with drainer, especially designed for use in a corner. It can be quickly put in position and the cup can be easily lifted from the frame for cleaning. Fig. 2 is another style of plate glass bathroom shelf, with a glass plate 27 x 5 x ¼ inch. It is made in two numbers, 3744, with brackets for front and ends, and 3745, adjustable with brackets for front only. Both articles have metal parts of nickeled brass.

## Stevens' Anti-Rust Gun Grease and Cleaning Rod.

The J. Stevens Arms & Tool Company, Chicopee Falls, Mass., are introducing the gun grease and cleaning rod shown herewith. The grease is referred to as not only suitable for cleaning and protecting fire arms, but for bright metals of any kind, for machinists' tools and surgical or dental instruments. It may also be used as a lubricant. The grease is put up in 2-ounce collapsible metal tubes, one dozen in a box, one gross in a case. The cleaning rod, No. 505, is made of twisted coppered wire, with a ringed handle and a twisted end of pure bristles. It is 27 inches in length, and furnished for .22, .32 and .38 calibers.


*Stevens' Anti-Rust Gun Grease and Cleaning Rod.*

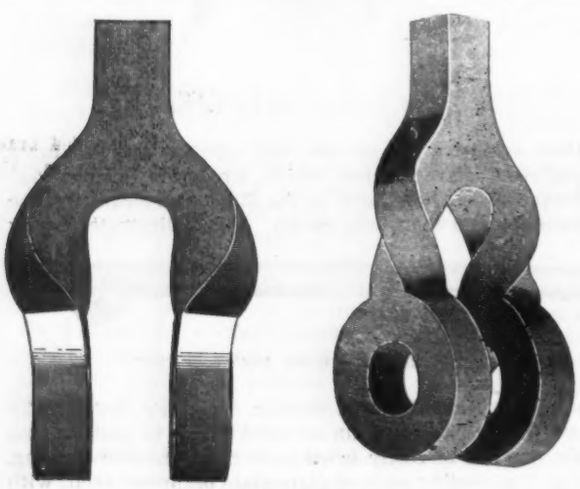
## Williamson's Tent Caterpillar Destroyer.

R. B. Williamson, Clifton Springs, N. Y., is offering the destroyer shown herewith, designed to destroy worms' nests on trees, bushes or shrubbery. When fire is desired the tank is filled with kerosene oil and the torch is lighted. Each stroke of the plunger produces a strong blast of fire which, it is explained, penetrates the nest, destroying it instantly, without the injury to the tree which would be caused by a steady flame. For spraying the torch is removed and the tank is filled with any suitable liquid poison. The entire length of the destroyer is 7 feet, and it can be operated from the ground or a ladder.

*Williamson's Tent Caterpillar Destroyer.*

## An Improved Clevis.

The clevis herewith illustrated is intended especially for use as brake rod jaws for railroad cars, road wagons, &c. Among the points of excellence the following are mentioned: That it is neat, light in weight, and reasonable in price, as compared with brake rod jaws in common use on railroad cars. The clevis is offered by the Jenkins Iron & Tool Company, Howard, Pa.



*An Improved Clevis.*

## The Turner Gasoline Bunsen Light.

The Turner Brass Works, 48 North Franklin street, Chicago, have placed on the market the Turner gasoline Bunsen light. The devices utilized make it possible to change from the incandescent to the Bunsen burner form when a high temperature, necessary for boiling, soldering and light brazing, is required. The attachment by which this quick change is accomplished is the prominent feature of the lamp. In the accompanying illustration the burner as used in cooking is shown on the left, and as transformed to give light rather than heat is shown on the right. The tripod provided for cooking utensils can be removed and the burner, which is swiveled, can be turned to point the flame in any direction. One of the salient features of the burner is that but little heat is necessary to generate, one or two matches, it is claimed, being all that is required. A special aluminum chimney, termed the Turner manyscope, is provided to focus the light when it is designed to produce light waves only, as is the case when used by the oculist, aurist or throat specialist.

*The Turner Gasoline Bunsen Light.*

C. W. McMahon has bought the business of O. P. Hanssen, Oxford Junction, Iowa, dealer in Hardware, Stoves, Tinware, Paints and Oils and Sporting Goods; also plumbing and furnace work. The new proprietor has commenced an addition to the store which will materially enlarge it.

# Current Hardware Prices.

## REVISED MAY 12, 1903.

**General Goods.**—In the following quotations General Goods—that is, those which are made by more than one manufacturer, are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

**Special Goods.**—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

**Range of Prices.**—A range of prices is indicated by means of the symbol @. Thus 33⅓@33⅓&10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

**Names of Manufacturers.**—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued April, 1902, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

**Standard Lists.**—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

**Additions and Corrections.**—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

### Abrasives—

Adamite in Carloads:
Crystal ₱ ton $90@100
Grain ₱ ton $120@140
See also *Emery*.

### Adjusters, Blind—

Domestic, ₱ doz. $3.00 33⅓%
North's 10%
Zimmerman's—See *Fasteners, Blind.*

### Window Stop—

Ives' Patent 25&5%
Tapiin's Perfection 25&5%

### Ammunition—See *Caps, Cartridges, Shells, &c.*

### Anvils—American—

Armand Hammer, Wrought ₱ lb 8½@8¾¢
Miel Patent Trenton ₱ lb 9½@9¾¢
Eagle Anvils ₱ lb 7¼@7¾¢
Hay-Budden, Wrought 9@9¼¢
Horseshoe brand, Wrought 9@9¼¢

### Imported—

Peter Wright & Sons ₱ lb 10½¢

### Anvil, Vise and Drill—

Millers Falls Co., $18.00 30&10%

### Apple Parers—See *Parers, Apple, &c.*

### Aprons, Blacksmiths'—

Hull Bros. Co.:
Lots of 1 doz. 25%
Smaller Lots. 20%
Lots of 3 doz. 30%

### Augers and Bits—

*Com. Double Spur* 70@70&10
*Gorbag Machine Augers* 66⅔@70%
*Car Bits, 12-in. twist* 60@60&10%
*Jennings' Pattern*
*Auger Bits* 50&10&5@60%
Ford's Auger and Car Bits 40%
Forstner Pat. Auger Bits 25%
C. E. Jennings & Co.:
No. 10 ext. lip. R. Jennings' list 25&10%
No. 30. R. Jennings' List. 40&7½&10%
Russell Jennings' 25&10&2½%
L'Hommedieu Car Bits 15&10%
Mayhew's Countersink Bits 45%
Millers' Falls 50&10&2½%
Pugh's Black 30%
Pugh's Jennings' Pattern 35%
Snell's Auger Bits 60%
Snell's Bell Hangers' Bits 50&10%
Snell's Car Bits, 12-in. twist 60%
Wright's Jennings Bits (R. Jennings' list) 50%

### Bit Stock Drills—

*Standard List* 65&5@70%

### Expansive Bits—

Clark's small, $15; large, $20 50&10%
Lavigne's Clark's Pattern, No. 1, ₱ doz., $20; No. 2, $18 50&10%
C. E. Jennings & Co., Steer's Pat. 25&10%
Ewan's 6%

### Gimlet Bits—

*Common Double Cut* gro. $2.50@3.00
*German Pattern* gro. $4.00@4.25

### Hollow Augers—

*Bonney Pattern*, per doz. $11.00@11.50
Ames 25&10%
New Patent 25&10%
Universal 20%
Wood's Universal 25%

### Ship Augers and Bits—

Ford's 40%
Snell's 40%
C. E. Jennings & Co.:
L'Hommedieu's 15&10%
Watrous' 33⅓&10%

### Awl Hafts, See *Hafts, Awl.*

### Awls—

*Brad Awls:*
*Handled* gro. $2.75@3.00
*Unhandled, Shouldered* gro. 55@60c
*Unhandled, Patent* gro. 66@70¢
*Peg Awls:*
*Unhandled, Patent* gro. 31@34c
*Unhandled, Shouldered* gro. 65@70c
*Scratch Awls:*
*Handled, Common* gro. $3.50@4.00
*Handled, Socket* gro. $11.50@12.00
Hurwood 9%

### Awl and Tool Sets—See *Sets, Awl and Tool.*

### Axes—

*First Quality, factory brands* $6.00
*First Quality, jobbers' brands* $5.50
*Second Quality* $5.00@5.25

### Axle Grease—See *Grease, Axle.*

### Axles—

*Iron or Steel*

*Concord, Loose Collar* 4½@5c
*Concord, Solid Collar* 4¾@5½c
*No. 1 Common* 3¾@4 c
*No. 1 Com. New Style* 3¾@4 c
*No. 2. Solid Collar* 4¼@4½c
*Nos. 11 to 14* 60&10&10@70%
*Nos. 15 to 18* %
*Nos. 19 to 22* 70&10&5%

*2% cash 10 days.*

### Boxes, Axle—

*Common and Concord, not turned* lb. 4½@4¾c
*Common and Concord, turned* lb. 5@5¼c
*Half Patent* lb. 9@9½c

### Balances—Sash—

Caldwell new list 50%
Pullman's 60%

### Spring—

*Spring Balances* 50&10@6%
Chatillon's:
Light Spr. Balances 40&10%
Straight Balances 40%
Circular Balances 50%
Large Dial 30%
Peerless 50%

### Barb Wire—See *Wire, Barb.*

### Bars—Crow—

*Steel Crowbars, 10 to 40 lb., per lb.* 3@3¼c

### Towel—

No. 10 Ideal, Nickel Plate ₱ gro. $8.50
No. 20 Ideal, Brass Finish ₱ gro $8.50

### Baskets—

Hoffman's Brick Baskets each $3.25

### Beams, Scale—

*Scale Beams, List Jan. 12, '85* 40&10%
Chattillon's No. 1 30%
Chattillon's No. 2 40%

### Beaters—Egg—

Lightning Chain, ₱ doz, $1.15; ₱ gro. $12.00
National Mfg. Co.: ₱ gro.
No. 1 Dover, Family size $7.00
No. 2 Dover, Hotel size 14.00
Taplin Mfg. Co.: ₱ gro.
No. 65 Improved Dover $6.50
No. 75 Improved Dover $7.50
No. 75-2 Imp'd Dover, Tin'd $9.00
No. 100 Improved Dover $8.00
No. 102 Improved Dover, Tin'd $9.50
No. 150 Improved Dover, Hotel $15.00
No. 152 Imp'd Dover, Hotel, Tin'd $17.00
No. 200 Imp'd Dover Tumbler $9.00
No. 202 Imp'd Dover Tumbler, Tin'd $10.00
No. 300 Imp'd Dover Mammoth, ₱ doz. $27.00
Wonder (S. S. & Co.) ₱ gro. $6.00

### Bellows—

*Blacksmith, Standard List* 70@70&10%

### Blacksmiths'—

| Inch.. | 30 | 32 | 34 | 36 | 38 | 40 |
|---|---|---|---|---|---|---|
| Each | $3.50 | 3.75 | 4.25 | 4.80 | 5.35 | 6.15 |

*Extra Length:*

| Each | $4.05 | 4.55 | 5.10 | 5.60 | 6.50 | 7.50 |
|---|---|---|---|---|---|---|

### Molders—

| Inch | 9 | 10 | 11 | 12 | 13 |
|---|---|---|---|---|---|
| Doz | $8.00 | 9.50 | 10.90 | 12.80 | 14.25 |

### Hand—

| Inch | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|
| Doz | $4.75 | 5.70 | 6.60 | 7.60 | 8.50 |

*Net Prices.*

### Bells—Cow—

*Ordinary goods* 75&5@75&10%
*High grade* 70@70&10%
Jersey 75&10%
Texas Star 50%

### Door—

Abbe's Gong 45%
Barton Gong 55%
Home, R. & E. Mfg. Co.'s 55&10%
Lever and Pull, Sargent's 60&10&10%
Yankee Gong 35%

### Hand—

*Hand Bells, Polished* 60&5@60&10%
*White Metal* 55@55&10%
*Nickel Plated* 50@50&5%
*Swiss* 60@60&7½%
Cone's Glass Hand Bells 30½@31½&10%
Silver Chime 33⅓@33⅓&10%

### Miscellaneous—

*Farm Bells* lb. 2@2¼c
*Steel Alloy Church and School* 60%
American Tube & Stamp'g Co. Gongs 70%
Trip Gong Bells 35&10@60%

### Belting—Rubber—

*Agricultural (Low Grade)* 75&10@80%
*Common Standard* 75@75&10%
*Standard* 70@70&10%
*Extra* 60&10&5%
*High Grade* 50&10@50&10&5%
Boston Belting Co.:
Seamless Stitched Imperial 45&5%
Boston 50&5%
Niagara 60&5%

### Leather—

*Extra Heavy, Short Lap* 60@60&5%
*Regular Short Lap* 60&10@60&10&10%
*Standard* 70@70&5%
*Light Standard* 70&10%
*Cut Leather Lacing* 60&10%
*Leather Lacing Sides, per sq. ft.* 18c

### Bench Stops—See *Stops, Bench*

### Benders and Upsetters, Tire—

Detroit Perfected Tire Bender 40%
Green River Tire Benders and Upsetters 20%
Detroit Stoddard's Lightning Tire Upsetters, No. 1, $3.75; No. 2, $6.50; No. 3, $9.50; No. 4, $14.75; No. 5, $18.75.

### Bicycle Goods—

John S. Long's Son's 1902 list:
Chain 50%
Parts 50%
Spokes 50%
Tubes 60%

### Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

### Blocks—Tackle—

*Common Wooden* 70@10@75%
No low steel Blocks, with Ford's Patent Sheaves 50&10%
Lane's Patent Automatic Lock and Junior 30%
Stowell's Novelty, Mal. Iron 50&10%
See also *Machines, Hoisting.*

### Boards Stove—

*Zinc, Crystal, &c.* 30&10%

### Bolts—Carriage, Machine &c.—

*Common, list Feb. 1, '02* 60&10@...%
*Norway Iron, $3.00, list Jan. 1, '98* 80@80&5%
*Phila. Eagle, $3.00 list May 24, '99* 80@80&5%
*Bolt Ends, list Feb. 14, '95* 65&5@...%
*Machine, list Oct. 1, '99* 65@...%
*Machine with C & T. Nuts* 60&2½@...%

NOTE.—*Jobbers are in many cases underselling the manufacturers.*

### Door and Shutter—

*Cast Iron Barrel, Round Brass Knob:*

| Inch | 3 | 4 | 5 | 6 | 8 |
|---|---|---|---|---|---|
| Per doz | $0.26 | .30 | .39 | .47 | .65 |

*Cast Iron Spring Foot:*

| Inch | 6 | 8 | 10 |
|---|---|---|---|
| Per doz | $1.00 | 1.25 | 1.75 |

*Cast Iron Chain, Flat, Japanned:*

| Inch | 6 | 8 | 10 |
|---|---|---|---|
| Per doz | $0.75 | 1.05 | 1.30 |

*Cast Iron Shutter, Brass Knobs:*

| Inch | 6 | 8 | 10 |
|---|---|---|---|
| Per doz | $0.57 | .80 | 1.00 |

*Wrought Barrel Brass Knob:*

| Inch | 3 | 4 | 5 | 6 | 8 |
|---|---|---|---|---|---|
| Per doz | $0.44 | .50 | .61 | .70 | 1.28 |

*Wrought Barrel* ...75&10@75&10&10%
*Wrought "Bronzed* ...40&5@50&10%
*Wrought Flush, B. K.* ...50&10@50&10%
*Wrought Shutter* ...40&10&10@60&5%
*Wrought Square Neck* ...50@50&10%
*Wrought Sunk* ...50@50&10%
Ives' Patent Door ...60%

### Stove and Plow—

*Plow* ...60@...%
*Stove* ...80@80&10%

### Tire—

*Common* ...72½@72½&10%
*Norway Iron* ...60@50&5%
American Screw Company:
Norway Phila., list Oct. 16, '84 ...80%
Eagle Phila., list Oct. 16, '84 ...82½%
Bay State, list Dec. 28, '99 ...74½%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84 ...80%
Eagle Phila., list Oct. 16, '84 ...82½%
Eclipse, list Dec. 28, '99 ...72½%
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99 ...72½%
Norway Phila., list Oct. '84 ...80%
Union Nut Co.:
Tire Bolts ...72½%

### Borers, Tap—

*Borers Tap, Ring, with Handle:*

| Inch | 1 | 1⅛ | 1¼ | 2 |
|---|---|---|---|---|
| Per doz. | $4.50 | 5.00 | 5.75 | 7.25 |
| Inch | 2¼ | 2½ | | |
| Per Doz. | $8.65 | 11.50 | | |

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.65; No. 3, $2.50 each 25%

### Boxes, Mitre—

C. E. Jennings & Co. 25&10%
Langdon 15&10%
Schatz 40%

### Braces—

NOTE.—*Most Braces are sold at net prices.*

*Common Ball, American* ...$1.15@1.25
Barber's 50&10&10@60&10%
Fray's Genuine Spofford's ...60%
Fray's No. 70 to 120, $1 to 123, 207 to 414 ...60%
C. E. Jennings & Co. 50&5&10%
Mayhew's Ratchet ...60%
Mayhew's Quick Action Hay Patent 50%
Millers Falls Drill Braces 25&10%
P., S. & W. Co. Peck's Patent 60&10&65%

### Brackets—

*Wrought Steel* ...75&10@80%
Bradley's Wire Shelf:
Full cases ...80&10&10%
Broken cases ...80&10%
Griffin's Pressed Steel ...80%
Griffin's Folding Brackets ...70&10%

### Bright Wire Goods—See *Wire and Wire Goods.*

### Broilers—

Wire Goods Co. 75@75&10%

### Buckets, Well and Fire—

*See Pails*

### Bucks Saw—

Hoosier ₱ gro. $96.00

### Bull Rings—See *Rings, Bull.*

### Butts—Brass—

*Wrought list Sept., '96* ...30@30&5%
Cast Brass, Tiebout's 50%

### Cast Iron—

*Fast Joint, Broad* ...50@50&10%
*Fast Joint, Narrow* ...50@50&10%
*Loose Joint* ...50&5@50&10%
*Loose Pin* ...70&5@70&10%
*Mayer's Hinges* ...70&5@70&10%
*Parliament Butts* ...70&5@70&10%

### Wrought Steel—

*Table and Back Flaps* ...60%
*Narrow and Broad* ...60%
*Inside Blind* ...66&10%
*Loose Pin* ...60&10%
*Loose Pin, Ball and Steeple Tip* ...75%
*Japanned, Ball Tip Butts* ...60%
*Bronzed Wrt. Nar. and Inside Blind Butts* ...45&20@45&25%

*Extra 25&10 @33&10&10%*

### Cages, Bird—

Hendryx, Brass:
3000, 5000, 1100 series ...5%
1200 series ...33⅓%
200, 300, 600 and 900 series ...40&10%
Hendryx Bronze:
700, 800 series ...40&10%
Hendryx Enameled ...40&10%

### Calipers—See *Compasses.*

### Calks, Toe and Heel—

*Blunt, 1 prong* ...per lb. 4@4¼c
*Sharp, 1 prong* ...per lb. 4½@4¾c
Perkins' Blunt Toe ₱ lb 3½¢
Perkins' Sharp Toe ₱ lb 4 ¢

### Cannons—

Breech Loading, 32 cal. Cartridge, Toy Cannons ...per doz $2.00

### Can Openers—See *Openers, Can*

### Cans, Milk—

| | 5 | 8 | 10 gal. | |
|---|---|---|---|---|
| Illinois Pattern. | $1 50 | 2.00 | 2.25 | each. |
| Iowa Pattern... | .... | 2.35 | 2.50 | each. |
| | 20 | 30 | 40 | qts. |
| New York Patt'rn | 1.65 | 2.40 | 2.75 | each. |
| Baltimore Patt'rn | .... | 1.80 | 2.00 | each. |

### Cans, Oil—

Buffalo Family Oil Cans:

| 3 | 5 | 10 gal. |
|---|---|---|
| $48.00 | 60.00 | 120.00 gro |

### Caps—Percussion—

*Eley's E. B.* ..... *60c*
*G. D.* ..... *per M 32@34c*
*F. L.* ..... *per M 43@...c*
*G. E.* ..... *per M 47@50c*
*Musket* ..... *per M 62@...c*

### Primers—

*Berdan Primers, $1.00 per M* ..... *5%*
*B. L Caps (Sturtevant Shells) $1.00 per M* ..... *5%*
*All other primers per M. $1.22@$1.27*

### Cartridges—

*Blank Cartridges:*
*32 C. F., $5.50* ..... *10c&5%*
*38 C. F., $7 00* ..... *10c&5%*
*22 cal. Rim, $1.50* ..... *10c&5%*
*32 cal. Rim, $2.75* ..... *10c&5%*
*B. B. Caps, Con. Ball Swgd* ..... *$1 90*
*B. B. Caps, Round Ball* ..... *$1.49*
*Central Fire* ..... *25%*
*Target and Sporting Rifle* ..... *15c&5%*
*Primed Shells and Bullets* ..... *15c&10%*
*Rim Fire Sporting* ..... *50%*
*Rim Fire, Military* ..... *15c&5%*

### Cases, Show—

Sun, No. 102, Silent Salesman, 6 ft., $25.00

### Casters—

*Bed* ..... *70@70c&10%*
*Plate* ..... *60@60c&5%*
*Philadelphia* ..... *75@75c&10%*
Boss ..... 70&10%
Boss Anti-Friction ..... 70&10%
Martin's Patent (Phœnix) ..... 45%
Standard Ball Bearing ..... 45%
Tucker's Patent low list ..... 30%

### Cattle Leaders—

See *Leaders, Cattle.*

### Chain, Coil—

*American Coil, Jobbers' Shipments:*

| | | | | | | |
|---|---|---|---|---|---|---|
| *3-16* | ¼ | *5-16* | ¾ | *7-16* | ½ | *9-16* |
| *8.50* | *6.00* | *4.90* | *4.00* | *3.80* | *3.70* | *3.65* |
| ⅝ | ¾ | ⅞ | 1 to 1¼ inch. | | | |
| *3.60* | *3.55* | *3.50* | *3.40* | per 100 lb. | | |

*German Coil* ..... *60&10c@10%*

### Halters and Ties—

*Halter Chains* ..... *60c&10@60c&10c&10%*
*German Halter Chains, list July 24, '97* ..... *60c&10&10@70c&10%*
*Cow Ties* ..... *50c&10@60%*

### Trace, Wagon, &c.—

*Traces, Western Standard: 100 pair*
*6½—6-3, Straight, with ring* ..... *$27.00*
*6½—6-2, Straight, with ring* ..... *$28.00*
*6½—8-2, Straight, with ring* ..... *$33.00*
*6½—10-2, Straight, with ring* ..... *$37.00*
*Add 2c per pair for Hooks.*
*Twist Traces 2c per pair higher than Straight Link.*
*Trace, Wagon and Fancy Chains* ..... *60@60c&10%*

### Miscellaneous—

*Jack Chain, list July 10, '93:*
*Iron* ..... *60c&10@60c&10c&10%*
*Brass* ..... *60c&10@60c&10c&10%*
*Safety Chain* ..... *70c&10@75c&5%*
*Gal. Pump Chain* ..... *lb. 4¾4¼c*
Covert Mfg. Co.
Breast ..... 40&2%
Halter ..... 40&2%
Heel ..... 40&2%
Rein ..... 40&2%
Stallion ..... 40&2%
Covert Sad. Works:
Breast ..... 70%
Halter ..... 70%
Hold Back ..... 70%
Rein ..... 70%
Oneida Community:
Am. Coil and Halters ..... 40@45&5%
Am. Cow Ties ..... 45@50%
Eureka Coil and Halter ..... 45@50&5%
Niagara Coil and Halter ..... 45@50&5%
Niagara Cow Ties ..... 45&5@50&10&5%
Wire Dog Chains ..... 45@50&5%
Wire Goods Co.:
Dog Chain ..... 70&10%
Universal Dbl-Jointed Chain ..... 50%

### Chalk—(From Jobbers.)

*Carpenters' Blue* ..... *gro. 40@45c*
*Carpenters', Red* ..... *gro. 35@40c*
*Carpenters', White* ..... *gro. 30@35c*
*See also Crayons.*

### Checks, Door—

Bardsley's ..... 40&10%
Columbia ..... 50&10%
Eclipse ..... 60%

### Chests, Tool—

American Tool Chest Co.:
Boys' Chests, with Tools ..... 55%
Youths' Chests, with Tools ..... 40%
Gentlemens' Chests, with Tools ..... 30%
Farmers', Carpenters', etc, Chests, with Tools ..... 20%
Machinists' and Pattern Fitters' Chests, Empty ..... 50%
C. E. Jennings & Co.'s Machinists' Tool Chests ..... 33⅓&10%

### Chisels—Socket Framing and Firmer

*Standard List* ..... *70@70c&10%*
Buck Bros ..... 30%
Charles Buck ..... 30%
C. E. Jennings & Co. Socket Firmer No. 10 ..... 60&10%
C. E. Jennings & Co. Socket Framing No. 15 ..... 60&10%
Swan's ..... 70%
L. & I. J. White ..... 30@30&5%

### Tanged—

*Tanged Firmers* ..... *40c&5@40&10%*
Buck Bros ..... 30%
Charles Buck ..... 30%
C. E. Jennings & Co. Nos. 191, 181 ..... 16⅔&10%
L. & I. J. White, Tanged ..... 25&5%

### Cold—

*Cold Chisels, good quality. lb. 13@15c*
*Cold Chisels, fair quality.. lb. 11@12c*
*Cold Chisels, ordinary ..... lb. 8@9c*

### Chucks—

Beach Pat., each $8.00.. ..... 35&5%
Pratt's Positive Drive ..... 25%
Empire ..... 25%
Blacksmiths' ..... 25%
Skinner Patent Chucks:
Combination Lathe Chucks ..... 40%
Drill Chucks, Patent and Standard .. 30%
Drill Chucks, New Model ..... 25%
Independent Lathe Chucks ..... 40%
Improved Planer Chucks ..... 25%
Universal Lathe Chucks ..... 40%
Face Plate Jaws ..... 40%
Standard Tool Co.:
Improved Drill Chuck ..... 45%
Union Mfg. Co.:
Combination ..... 40%
Csar Drill ..... 30%
Geared Scroll ..... 30%
Independent ..... 40%
Union Drill ..... 30%
Universal ..... 40%
Face Plate Jaws ..... 35%
Wescott Patent Chucks:
Lathe Chucks ..... 50%
Little Giant Auxiliary Drill ..... 40%
Little Giant Double Grip Drill ..... 40%
Little Giant Drill, Improved ..... 40%
Oneida Drill ..... 40%
Scroll Combination Lathe ..... 40%

### Clamps—

Adjustable, Hammers' ..... 20@20&5%
Cabinet Sargent's ..... 50&10%
Carriage Makers', P., S. & W. Co. ..... 50%
Carriage Makers' Sargent's ..... 40%
Besly, Parallel ..... 33⅓&10%
Clamans, Utica Drop Forge & Tool Co 40%
Saw Clamps, *see Vises, Saw Filers'.*

### Cleaners, Drain—

Iwan's Champion, Adjustable ..... 33%
Iwan's Champion, Stationary ..... 40%

### Sidewalk—

Star Socket, All Steel ... ℔ doz. $4.05 net
Star Shank, All Steel ... ℔ doz. $3.24 net
W. & C. Snank, All steel, 7½ in. ℔ doz., $3.05; 8 in., $3.10; 8½ in., $3.25.

### Cleavers, Butchers'—

Foster Bros ..... 30%
New Haven Edge Tool Co.'s ..... 45%
Fayette R. Plumb ..... 33⅓&33⅓&10%
P., S & W ..... 50@50&5%
L. & I. J. White ..... 30%

### Clippers—

Chicago Flexible Shaft Company
'98 Chicago Horse ..... $8.75
1902 Chicago Horse ..... $10.75
Lightning Belt ..... $15.00
Chicago Belt ..... $20.00
Stewart's Patent Sheep ..... $18.50
15%

### Clips Axle—

*Eagle and Superior ¼ and 5-16 inch* ..... *70c&10%*
*Norway, ¼ and 5-16 inch* ..... *70@70c&10%*

### Cloth and Netting, Wire—See *Wire, &c.*

### Cocks, Brass—

*Hardware list:*
*Compression and Plain Bibbs* ..... *65c&5@65c&10%*
*Globe, Kerosene, Racking, &c., Cocks* ..... *65c&10@70%*

### Coffee Mills—See *Mills, Coffee.*

### Collars Dog—

Brass, Walter B. Stevens & Son's list. 40%
Embossed, Gilt, Walter B. Stevens & Son's list ..... 30&10%
Leather, Walter B. Stevens & Son's list 40%

### Combs Mane and Tail—

Covert's Saddlery Works ..... 60&10%

### Compasses Dividers, &c.

*Ordinary Goods* ..... *75@75c&5%*
Bemis & Call Hdw. & Tool Co.:
Dividers ..... 65%
Calipers, Call's Patent Inside ..... 55%
Calipers, Double ..... 65%
Calipers, Inside or Outside ..... 65%
Calipers, Wing ..... 60%
Compasses ..... 50%
J. Stevens A. & T. Co ..... 25&10%

### Compressors Corn Shock—

J. B. Hughes' ℔ doz ..... $2.50

### Conductor Pipe, Galva.—

*L. C. L. to Dealers:*

| *Territory.* | *Nested.* | *Not nested.* |
|---|---|---|
| *Eastern....* | *70c&12½&%* | *70c&12½%* |
| *Central....* | *70c&7½%* | *70%* |
| *Southern...* | *65c&10%* | *65c&5%* |
| *S. Western..* | *65c&7½%* | *65c&2½%* |

*Terms, 2% for cash. With delivery on full crates.*
See also *Eave Troughs.*

### Coolers, Water—

| Gal. each. | 2 | 3 | 4 | 6 | 8 | |
|---|---|---|---|---|---|---|
| Labrador | $1.20 | $1.50 | $1.80 | $2.10 | 2.70 | |
| Gal. | 3 | 4 | 6 | 8 | | |
| Iceland, ea. | $1.80 | $2.10 | $2.40 | $3.00 | | |
| Gal.... | 2 | 3 | 4 | 6 | 8 | |
| Galv. Lined Ea. | $1.85 | $2.00 | $2.25 | $2.90 | $3.90 | 25% |

Ga.v. Lined side handles

| Gal. | 2 | 3 | 4 | 6 | 8 |
|---|---|---|---|---|---|
| Each. | $1.95 | $2.15 | $2.40 | $3.3) | $4.15. 25% |

### Coopers' Tools—

See *Tools, Coopers'.*

### Cord—Sash—

*Braided, Drab* ..... *lb. 25c*
*Braided. White, Com.... lb, 17½@18c*
*Cable Laid Italian.. lb. A, 15c; B, 16c*
*Common India* ..... *lb 9 @9½c*
*Cotton Sash Cord, Twisted.... 12@16c*
*Patent Russia* ..... *lb. 13½@13c*
*Cable Laid Russia* ..... *lb. 13½@14c*
*India Hemp, Braided* ..... *lb 14@15c*
*India Hemp, Twisted* ..... *lb. 10@12c*
*Patent India, Twisted* ..... *lb. 10@12c*
Anniston Cordage Co.:
Old Glory, Nos. 7 to 12 ..... ℔ lb 24 ¢
Anniston, Nos. 7 to 12 ..... ℔ lb 19 ¢
Old Colony, Nos. 7 to 12 ..... ℔ lb 18½¢
Anni-ton Drab, Nos. to 12 ..... ℔ lb 24 ¢
Pearl Braided, cotton ..... ℔ lb 17½¢
Massachusetts, White ..... ℔ lb 22½¢
Massachusetts, Drab ..... ℔ lb 26½¢
Eddystone Braided Cotton ..... ℔ lb 19¢
Harmony Cable Laid Italian ..... ℔ lb 18¢
Ossawan Mills:
Crown, Solid Braided White... ℔ lb 22¢
Braided, Giant, White ..... ℔ lb 20¢
Peerless:
Cable Laid Italian ..... 16¢
Cable Laid Russian ..... 14¢
Cable Laid India ..... 12¢
Braided India ..... 18¢
Phœnix, White ..... 19¢
Samson, Nos. 7 to 12:
Braided, Drab Cotton ..... ℔ lb 32½¢
Braided, Italian Hemp ..... ℔ lb 32½¢
Braided, Linen ..... ℔ lb 49¢
Braided, White Cotton, Spot. ℔ lb 28½¢
No. 6 cords, 1¢ extra.
Silver Lake:
A quality, Drab, 40¢ ..... 15%
A quality, White, 35¢ ..... 15%
B quality, Drab, 35¢ ..... 15%
B quality, White, 30¢ ..... 15%
Italian Hemp, 40¢ ..... 15%
Linen, 57½¢ ..... 15%

### Wire, Picture—

*List Oct., '00* ..... *85c&10@85c&10c&5%*

### Crackers, Nut—

Little Giant ..... ℔ gr. $24.00

### Cradles—

*Grain* ..... *50%*

### Crayons—

*White Round Crayons, gross 5½@6c*
*Cases, 100 gro., $4.50, at factory.*
D. M. Steward Mfg. Co.
Metal Workers' Crayons, gr. $2.50
Soapstone Pencils, round, flat or square ..... gr. $1.50
Rolling Mill Crayons ..... gr. $2.50
Railroad Crayons (composition) gr. $2.00
Case lots 20%
See also *Chalk.*

### Crooks, Shepherds'—

Fort Madison, Heavy ..... ℔ doz. $7.00
Fort Madison, Light ..... ℔ doz. $6.50

### Crow Bars—See *Bars, Crow.*

### Cultivators—

Victor Garden ..... 50%

### Cutlery, Table—

International Silver Company:
No. 12 Medium Knives, 1847 ... ℔ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor ..... ℔ doz. $3.00
Wm. Rogers & Son ..... ℔ doz. $2.50
Simeon L. & Geo. H. Rogers Company:
12 dwt. Medium Knives ..... ℔ doz. $3.00
No. 77 Medium Knives ..... ℔ doz. $2.50

### Cutters—Glass—

H. H. Mayhew Co ..... 40%
Red Devil ..... 50%
Smith & Hemenway Co ..... 50%
Woodward ..... 40%

### Meat and Food—

*Hale's..Nos. 11 & 111 12 & 112 13 & 113*
*Per doz .. $8.00 10.75 14.50*
American ..... 30%

| Nos. | 1 | 2 | 3 | 4 | B | 5 |
|---|---|---|---|---|---|---|
| Each | $5 | $7 | $10 | $25 | $50 | $60 |

Enterprise ..... 25@25&7½%

| Nos. | 5 | 10 | 12 | 22 | 32 |
|---|---|---|---|---|---|
| Each | $2 | $3 | $2.75 | $4.50 | $6 |

Dixon's, ℔ doz ..... 30&10@40%

| Nos. | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| | $14.00 | $17.00 | $19.00 | $30.00 |

Home No. 1, ℔ doz. $32.75 ..... 50&10%
Little Giant, ℔ doz ..... 33⅓&5@40%

| Nos. | 305 | 310 | 312 | 320 | 322 |
|---|---|---|---|---|---|
| | $35.00 | $48.00 | $44.00 | $72.00 | $68.00 |

N. E Food Choppers ..... 40%
Sterling ..... 40@40&1 %
No 1 $2.00 each No. 2 ..$2.50 each
New Triumph No. 605, ℔ doz. $24.00 .. 30&10@40%
Woodruff's, ℔ doz ..... 30&10@40%

| Nos. | 100 | 150 |
|---|---|---|
| | $15.00 | $18.00 |

Enterprise Beef Shavers ..... 25@30%

### Slaw and Kraut—

Henry Disston & Sons:
Slaw, Corn Grater, &c ..... 40%
Kraut Cutters 24 x 7, 26 x 8, 30 x 9. 55%
Kraut Cutters 36 x 12, 40 x 12 ..... 40%
Sterling, $6.00 each ..... 33⅓%
Tucker & Dorsey Mfg. Co.:
Kraut Cutters ..... 40%
Slaw Cutters, 1 Knife, ℔ gr. ...$18@$20
Slaw Cutters, 2 Knife, ℔ gr.. .$22@$36

### Tobacco—

*All Iron, Cheap ..... doz. $4.25@$4.50*
Enterprise ..... 25@50%
National, ℔ doz. No. 1, $21; No. 2, $18.. 40%
Sargent's, ℔ doz., No. 2 ..... 60%
Sargent's No 12 and 21 ..... 50&10%

### Washer—

Appleton's, ℔ doz. $16.00 ..... 50&10%
Bonney's ..... 40%

## Diggers, Post Hole, &c.—

Dalbey Post Hole Auger ... per doz., $9.00
Iwan's Improved Post Hole Auger. 40&5%
Iwan's Vaughan Pattern Post Hole Augers, ℔ doz ..... $6.75
Iwan's Perfection Post Hole Digger.. ℔ doz. $8.50
Iwan's Split Handle Post Hole Diggers, ℔ doz ..... $7.50
Kohler's Universal ..... ℔ doz. $15.00
Kohler's Little Giant ..... ℔ doz. $12.50
Kohler's Hercules ..... ℔ doz. $10.00
Kohler's Invincible ..... ℔ doz. $9 00
Kohler's Rival ..... ℔ doz. $8.50
Porter's Plain, No. 6 ..... ℔ doz. $6 75
Porter's Ornamental, No. 70. ℔ doz. $10.50
Porter's No. 99 ..... $9.00
Porter's No. 44 ..... $10.75

### Dividers—See *Compasses.*

### Doors, Screen—

Phillips', style E, ¾ in. ..... ℔ doz, $10.50
Phillips', style 077, ¾ in. ..... ℔ doz, $8.00
Phillips', style x-r, ¾ in. ..... ℔ doz, $11.00
Porter's Plain, No. 6 ..... ℔ doz. $6 75
Porter's Ornamental, No. 70. ℔ doz. $10.50
Porter's No. 99 ..... $9.00
Porter's No. 44 ..... $10.75

### Drawers Money—

Sun Money Drawers, No. 5, ℔ doz. $9.50; No. 6, with Bell, $10.00; No. 6, with Gong, $10.50.
Tucker's Pat. Alarm Till No. 1, ℔ doz. $18; No. 2, $15; No. 3, $12; No. 4, $18.

### Drawing Knives—

See *Knives, Drawing.*

### Drills and Drill Stocks—

*Common Blacksmiths' Drill.. each $1.50@$1.75*
*Blacksmiths' Self-feeding, $3.75@4.00*
Breast, Millers Falls ..... 15&10%
Breast, P., S. & W ..... 40&5%
Goodell Automatic Drills.. 40&5@40&10%
Johnson's Automatic Drills Nos. 2 and 3 ..... 16⅔&10%
Johnson's Drill Points ..... 16⅔&5&10%
Millers Falls Automatic Drills ... 33⅓&10%
Ratchet, Curtis & Curtis ..... 25%
Ratchet, Parker's ..... 40%
Ratchet, Weston's ..... 33⅓%
Ratchet, Whitney's, P. S. & W ..... 50%
Whitney's Hand Drill, No. 1, $10.00; Adjustable, No. 10, $12.00 ..... 33⅓%

### Twist Drills—

*Standard List.... 65c&10@60c&10c&10%*

### Drill Bits or Bit Stock Drills—See *Augers and Bits.*

### Drivers, Screw—

*Screw Driver Bits..per doz. ..45@75c*
Balsey's Screw Holder and Driver, ℔ doz. 2½-inch, $6; 4-in., $7.50 6-in., $9..40%
Buck Bros ..... 30%
Buck Bros' Screw Driver Bits ..... 30%
Champion ..... 60%
Edson ..... 60%
Fray's Hol. H'dle Sets, No. 3, $12.00 50%
Gay's Double Action Ratchet ..... 35%
Goodell's Auto 50&10&10@50&10&10&--
Hurwood ..... 40%
Mayhew's Black Handle ..... 50%
Mayhew's Monarch ..... 40&10%
Millers Falls, Nos. 20 and 21 ..... 25&10%
Millers Falls, Nos. 11, 12, 41, 42 ..... 15&10%
Never Turn ..... 60%
New England Specialty Co ..... 50%
Sargent & Co.'s:
Nos. 1, 50, 55 and 60 ..... 60%
Nos. 20 and 40 ..... 70%
Smith & Hemenway Co ..... 40&5%
Stanley's R. & L. Co.'s:
No. 64, Varnished Handles 30@60&10&10%
No. 86 ..... 70@70&10&10%
Swan's:
Nos. 65 to 68 ..... 50%
No. 40 ..... 40&10%
Nos. 25, 35 and 45 ..... 20&10&10%

### Eave Trough, Galvanized

| *Territory.* | *L. C. L.* | |
|---|---|---|
| *Eastern* | *75c&16⅔&%* | |
| *Central* | *75c&12½%* | |
| *Southern* | *75c&2½%* | |
| *S. Western* | *75%* | |

*Terms, 2% for cash.*
See also *Conductor Pipe and Elbows.*

### Elbows and Shoes—

*Factory shipments* ..... *60%*
Perfect Elbows (S. S. & Co.) ..... 30%

### Emery, Turkish—

| | *4 to 5* | *6 to 50* | *Flour* |
|---|---|---|---|
| *Kegs* ..... *lb.* | *5c* | *5½c* | *3½c* |
| *½ Kegs* ..... *lb.* | *5½c* | *5¾c* | *3¼c* |
| *Kegs* ..... *lb* | *5c* | *6c* | |
| *10-lb cans. 10 in case* | *6½c* | *7c* | *6c* |
| *10-lb. cans, less than 10* | *10c* | *10c* | *8c* |

NOTE.—*In lots 1 to 3 tons a discount of 10% is given.*

### Extractors, Lemon Juice—See *Squeezers, Lemon.*

### Fasteners, Blind—

Zimmerman's ..... 50&10%
Walling's ..... 50%

### Cord and Weight—

Ives ..... 40%

### Faucets—

*Cork Lined* ..... *50@50c&10%*
*Metallic Key, Leather Lined* ..... *70@70c&10%*
*Red Cedar* ..... *50c&10@50%*
*Petroleum* ..... *70c&5@75%*
B. & L. B. Co.:
Metal Key ..... 60&10%
Star ..... 60%
West Lock ..... 50&10%
John Sommer's Peerless Tin Key ..... 40%
John Sommer's Boss Tin Key ..... 50%
John Sommer's Victor Metal Key. 50&10%
John Sommer's Duplex Metal Key ..... 60%
John Sommer's Diamond Lock ..... 40%
John Sommer's I. X. L. Cork Lined .. 50%
John Sommer's Reliable Cork Lined ..... 50&10%
John Sommer's Chicago Cork Lined .. 60%
John Sommer's O. K. Cork Lined ..... 50%
John Sommer's No Brand, Cedar ..... 50%
John Sommer's Perfection Cedar ..... 40%
McKenna, Brass:
Burglar Proof, N. P ..... 35%
Improved, ¼ and ⅜ inch ..... 35%
Self Measuring:
Enterprise, ℔ doz. $30.00 ..... 40&10%
Lane's, ℔ doz. $36.00 ..... 40&10%
National Measuring, ℔ doz. $36..40&10%

### Felloe Plates—See *Plates, Felloe.*

### Files—Domestic—

*List revised Nov. 1, 1899.*
*Best Brands* ..... *70c&5@70c&10%*
*Standard Brands* ..... *75@75c&10c&%*
*Second Quality* ..... *75c&10c&10@30c&5%*

### Imported—

*Stubs' Tapers, Stubs' list, July 24, '97* ..... *30%*

### Fixtures, Grindstone—

*Net Prices:*

| *Inch....* | *15* | *17* | *19* | *21* | *24* |
|---|---|---|---|---|---|
| *Per doz.* | *$2.60* | *2.75* | *3.00* | *3 50* | *4.40* |

P., S. & W. Co ..... 30&10@40%
Reading Hardware Co ..... 60%
Sargent's ..... 60&10&10%
Stowell's Giant Grindstone Hanger ..... ℔ doz. $6.00
Stowell's Grindstone Fixtures, Extra Heavy ..... 50&10&10%
Stowell's Grindstone Fixtures Light... 60&10%

### Fodder Squeezers—See *Compressors.*

**Forks**—*Aug. 1, 1899, list.*
*Hay, 2 tine* ..... 65%
*Hay 3 tine* ..... 60&10½%
*Hay, 4 tine* ..... 66⅔%
*Hay, Header and Baler 3 tine* 6 @ 15%
*Hay, Header and Baler, 4 tine* 66⅔%
*Grain or Barley* ..... 70%
*Manure, 4 tine* ..... 60&20%
*Manure, 5 and 6 tine* ..... 60&20%
*Spading* ..... 70&5%
Extra 10%
Iowa Dig-Ezy Potato ..... 65%
Victor, Hay ..... 66⅔%
Victor, Manure ..... 66⅔%
Victor, Header ..... 66⅔%
Champion, Hay ..... 66⅔%
Champion, Manure ..... 66⅔&5%
Columbia, Hay ..... 66⅔&5%
Columbia, Manure ..... 70%
Columbia, Spading ..... 70&10%
Hawkeye Wood Barley 4 tine ₩ doz. $5.00; 6 tine, $6.00.
W. & C. Potato Digger ..... 65%
Acme Hay ..... 60&10&7½%
Acme Manure, 4 tine ..... 60&20&10%
Acme Manure, 6 tine ..... 66⅔&10&2%
Dakota Reader ..... 65&15&5%
Jackson Steel Barley ..... 65&15&5%
Kansas Reader ..... 66⅔%
W. & C. Favorite Wood Parley 4 tine, ₩ doz., $5.00; 6 tine, $6.00.
Plated.—See *Spoons.*

**Frames— Saw—**
*Red, Polished and Varnished..doz.* $1.15@$1.35
*White* ..... *doz.* 75@80c

**Freezers Ice Cream—**

| Qts... | 2 | 3 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| Best | $1.15 | 1.65 | 1.95 | 2.40 | 3.30 | 4.20 |
| Good | $1.25 | 1.50 | 1.70 | 2.15 | 2.75 | 3.75 |
| Fair | $1.00 | 1.10 | 1.30 | 1.75 | 2.30 | 2.90 |

**Fruit and Jelly Presses—**
See *Presses, Fruit and Jelly.*

**Fry Pans**—See *Pans, Fry.*

**Fuse—** *Per 1000 Feet.*
*Hemp Fuse* ..... $2.60
*Cotton Fuse* ..... 2.90
*Single Taped Fuse* ..... 3.25
*Double Taped Fuse* ..... 4.30
*Triple Taped Fuse* ..... 5.00
10&2½%

## Gates, Molasses and Oil—

*Stebbins' Pattern* ..... 80@80&10%

**Gauges—**
*Marking, Mortise, &c.* ..... 50&10@50&10&10%
Chapin-Stephens Co.:
Marking, Mortise, etc. 50&10@50&10&10%
Scholl's Patent ..... 50&10@50&10&10%
Door Hangers ..... 50@50&10%
Fulton's Butt Gauge ..... 30&10%
Stanley R. & L. Co.'s Butt & Babbet Gauge ..... 20@20&10&10%
Wire, Brown & Sharpe's ..... 25%
Wire, Morse's ..... 25%
Wire P., S. & W. Co ..... 30&10%

**Gimlets— Single Cut—**
*Nail, Metal, Assorted..gro. $1.40@1.60*
*Spike, Metal, Assorted gro. $2.80@3.25*
*Nail, Wood Handled, Assorted.* ..... *gro. $1.75@2.00*
*Spike, Wood Handled, Assorted* ..... *gro. $3.25@3.50*

**Glass, American Window**
*Jobbers' List, Dec. 16, 1902.*
*From store. Single and Double* ..... 90&10%
*F. O. B. factory, carload lots:*
*Single and Double* ..... 90&20&2½%
*2000 box lots* ..... 90&25%

**Glasses, Level—**
Chapin-Stephens Co. ..... 50@60&10&10&10%

**Glue—Liquid, Fish—**
*List A, Bottles or Cans, with Brush.* ..... 37½@50%
*List B, Cans (½ pts., pts., qts)* ..... 33⅓@48%
*List C, Cans (½ gal., gal.)* ..... 25@45%
International Glue Co. (Martin's) ..... 4&10&5%

**Grease, Axle—**
*Common Grade* ..... *gro. $5.00@6.00*
Dixon's Everlasting ..... 10-₩ pails, ea. 85¢
Dixon's Everlasting, in bxs.. ₩ doz. 1 ₩ $1.20; 2 ₩ $2.00

**Griddles, Soapstone—**
Pike Mfg. Co ..... 33⅓@33⅓&10%

**Grindstones—**
Bicycle Emery Grinder ..... $6.50
Bicycle Grindstones, each ..... $2.50@3.00
Pike Mfg. Co:
Improved Family Grindstones, per inch, per doz. ..... $2.00 } 33⅓%
Pike Mowe Knife and Tool Grinder, each ..... $1.00 }
Velox Ball Bearing, mounted, Angle Iron Frames ..... each, $3.25

**Guards, Snow—**
Cleveland Wire Spring Co.:
Galv. Steel ₩ 100 ..... $9.00
Copper ₩ 1000 ..... $18.00

## Halters and Ties—

Covert Mfg. Co.:
Web ..... 45&2%
Jute Rope ..... 40&5&2%
Sisal Rope ..... 20&2%
Covert's Saddlery Works:
Web and Leather Halters ..... 70%
Jute and Manila Rope Halters ..... 70%
Sisal Rope Halters ..... 60&20%
Jute, Manila and Cotton Rope Ties .. 70%
Sisal Rope Ties ..... 60&10%

**Hammers—**
**Handled Hammers—**
Heller's Machinists' .. 40&10&4&10&10%
Heller's Farriers' .... 40&10&4&10&10%
Magnetic Tack, Nos. 1, 2, 3, $1.25, $1.50, $1.75 ..... 40@40&10&10%
Peck, Stow & Wilcox ..... 50%
Fayette R. Plumb:
Plumb, A. E. Nail. 33⅓&7½&33⅓&10&7½%
Engineers' and B. S. Hand ..... 50&7½&5@50&10&7½&5%
Machinists' Hammers 50&5@50&10&5%
Riveting and Tinners' ..... 40&2½@40&10&2½%
Sargent's C. S. New List ..... 40%

**Heavy Hammers and Sledges—**
*3 lb. and under* ..... *lb. 45c* } 75&5@75
*3 to 5 lb* ..... *lb. 36c* } &10%
*Over 5 lb* ..... *lb. 30c* }
*Wilkinson's Smiths'* ..... 9½c@10c lb.

**Handles—**

**Agricultural Tool Handles—**
*Axe, Pick, &c.* ..... 50@50&5%
*Hoe, Rake, &c* ..... 60@60&5%
*Fork, Shovel, Spade, &c.:*
*Long Handles* ..... 60%
*D Handles* ..... 50%

**Cross-Cut Saw Handles—**
Atkins' ..... 40&5%
Champion ..... 45@45&10%
Disston' ..... 50%

**Mechanics' Tool Handles—**
*Auger, assorted* ..... *gro. $2.30@$2.50*
*Brad Awl* ..... *gro. $1.25@$1.50*
*Chisel Handles:*
*Apple Tanged Firmer, gro. ass'd. $2.25@$2.35; large, $2.50@$2.60.*
*Hickory Tanged Firmer, gro. ass'd. $1.75@$2.20; large, $2.50@$3.70.*
*Apple Socket Firmer, gro. ass'd, $1.70@$1.85; large, $2.00@$2.25*
*Hickory Socket Firmer, gro. ass'd. $1.60 @ $1.75; large, $1.75 @ $2.00*
*Hickory Socket Framing, gro. ass'd. $2.50@$2.75; large, $2.65@$2.85*
*File, assorted* ..... *gro. $1.00@$1.15*
*Hammer, Hatchet, Axe, &c* ..... 50%
*Hand Saw, Varnished, doz. 70@75c*
*Not Varnished* ..... 55@60c
*Plane Handles:*
*Jack, doz. 25c; Jack Bolted* ..55@60c
*Fore, doz. 35@38c; Fore, Bolted* .. 70@75c
Chapin-Stephens Co.:
Carving Tool ..... 40@40&10%
Chisel ..... 65@65&10%
File and Awl ..... 65@65&10%
Saw and Plane ..... 40@40&10%
Screw Driver ..... 40@40&10%
Millers Falls Adj. and Ratchet Auger Handles ..... 15&10%
Nicholson Simplicity File Handle, ₩ gro. ..... $0.85@$1.50

**Hangers—**
*Barn Door, New Pattern, Round Groove, Regular:*

| Inch..... | 3 | 4 | 5 | 6 | 8 |
|---|---|---|---|---|---|
| *Single Doz.* | $0.85 | 1.20 | 1.50 | 1.90 | 2.80 |

*Barn Door, New England Pattern, Check Back, Regular:*

| Inch..... | 3 | 4 | 5 | 6 |
|---|---|---|---|---|
| *Single Doz.* | $1.10 | 1.60 | 2.15 | 2.70 |

Alith Mfg. Co.
Reliable ..... per doz. $15.00
Chicago Spring Butt Co.:
Friction ..... 25%
Oscillating ..... 25%
Big Twin ..... 25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door ..... 50%
Elevator ..... 40%
Railroad ..... 55%
Cronk & Carrier Mfg. Co.:
Loose Axle ..... 60%
Roller Bearing ..... 60&10%
Lane Bros. Co.:
Parlor, Ball Bearing ..... $4.15
Parlor, Standard ..... $3.35
Parlor, New Model ..... $2.85
Parlor New Champion ..... $2.25
Barn Door, Standard. 50&10&10&5%
Covered ..... 50&10&10%
Special ..... 50&10&10&5%
Lawrence Bros.:
Advance ..... 60%
Cleveland ..... 60&10%
Crown ..... 60%
Giant ..... 50&10%
New York ..... 60%
Peerless ..... 60&10%
Sterling ..... 60%
Swing, No. 95 ..... 50&10%
Union, No. 44, $5.00; No. 45 $7.00; No. 46, $9.00.
McKinney Mfg. Co.:
No. 1, Special, $15 ..... 60&10%
No. 2, Standard, $18 ..... 60&10%
Hinged Hangers, $16 ..... 50%
Meyers' Stayon Hangers. 50&10% (net)
C. S. Smith Mfg. Co.:
Lundy Parlor Door ..... 50&10%
Monarch Barn Door ..... 60&10%
Never Jump Hinge ..... 50&10%
Peerless ..... 60&10%
Perfection ..... 70&5%
Phœnix ..... 70&5%
Wagner's Adjustable ..... 70&10%
Warehouse Anti-Friction ..... 60%
Richards Mfg. Co.:
Pioneer Wood Track No. 3 ..... $2.25
Imp'd Wood Track No. 5 ..... $2.25
Imp'd Steel Track No. 7 ..... $2.70
Imp'd Steel Track No. 7 ..... $2.65
Ball B'r'g Steel Track No. 9 ..... $2.50
Ball B'r'g Steel Track No. 10 ..... $2.50
Roller B'r'g Steel Track No. 11 ..... $2.45
Roller B'r'g Steel Track No. 12 ..... $2.40
Ball B'r'g Steel Track No. 13 ..... $2.75
Roller B'r'g Steel Track No. 14 ..... $2.65
Ball B'r'g Trolley Track No. 15 ..40%
Ball B'r'g Trolley Track No. 19 ..40&5%
Ball Bearing Tandem Trolley Track No. 16 ..... 40%
Silent Adjustable Track No. 18 ..... 40%
Auto Adjustable Track No. 22 ..... 40%
Trolley B. D. No. 17 ..... $1.60
Trolley F. D. No. 120 ..... $2.70
Trolley F. D. No. 121 ..... $2.55
Trolley F. D. No. 131 ..... $3.00
Roller Bearing D. D. No. 25 ..... 70&5
Roller Bearing U. S. B. D. ..... 70&5%
Anti Friction B. D. ..... 60&10%
Ives' Wood Track No. 1 ..... $2.15
Ives' Imp'd Wood Track No. 2 .. $2.15
Stowell Mfg. and Foundry Co.
Acme Parlor Ball Bearing ..... 40%
Atlas ..... 60%
Badger Barn Door ..... 50%
Baggage Car Door ..... 50%
Climax Anti-Friction ..... 50%
Elevator ..... 40%
Express ..... 50%
Interstate ..... 60%
Landy Parlor Door ..... 50%
Magic ..... 50%
Matchless ..... 60%
Narsen ..... 60&10%
Railroad ..... 50%
Street Car Door ..... 50%
Steel, Nos. 400, 401, 500 ..... 40&15%
Stowell Parlor Door ..... 50%
Wild West, Nos. 399, 401, 500 ..... 50%
Zenith for Wood Track ..... 50%
A. . Swet: Iron Works:
Eagle ..... 60&10%
Helio ..... 50&10%
Perfection ..... 60%
Pilot ..... 40%
Taylor & Boggis Fy Co. 50&15&10&5%
Wilcox Mfg. Co.:
Bike Roller Bearing ..... 60&10%
C. J. Roller Bearing ..... 60&10%
Cycle Ball Bearing ..... 50%
Dwarf Ball Bearing ..... 40%
Ives, Wood Track ..... 60&10%
L. T. Roller Bearing ..... 60&10&5%
New Era Roller Bearing ..... 50&10%
O. K. Roller Bearing ..... 60&10&5%
Prindle, Wood Track ..... 60%
Richards' Wood Track ..... 60%
Richards' Steel Track ..... 50&10%
Spencer Roller Bearing ..... 60&10%
Tandem Nos. 1 and 2 ..... 60%
Underwriters' Roller Bearing ..40%
Velvet ..... 50%
Wilcox Auditorium Ball Bearing 30%
Wilcox Barn Trolley No. 123 ..... 40%
Wilcox Elv. Door, Nos 112 and 122 ¼ 50%
Wilcox Elv. Door, No. 132 ..... 40%
Wilcox Fire Trolley, Roller Bearing ..... 30%
Wilcox Le Roy Noiseless Ball Bearing ..... 40%
Wilcox New Century ..... 50&10&10%
Wilcox O. K. Steel Track ..... 50%
Wilcox O. K. Trolley ..... 50%
Wilcox Trolley Ball Bearing ..... 40%
Wilcox Wideman Narrow Gauge. Ball Bearing ..... 40%
For Track, see *Rail.*

**Hangers, Gate—**
Myers' Patent Gate Hangers, ₩ doz., net, $4.50

**Hasps—**
McKinney's Perfect Hasp ₩ doz..... 50%

**Hatchets—**
*Best Brands* ..... 50@50&10%
*Cheaper Brands* ..... 60@60&10%
*Note.—Net prices often made.*

**Hinges—**

**Blind and Shutter Hinges—**
*Surface Gravity Locking Blind: (Victor; National; 1868 O. P. Niagara; Clark's O. P.; Clark's Tip; Buffalo.)*

| No. | 1 | 3 | 5 |
|---|---|---|---|
| *Doz. pair* | $0.85 | 1.75 | 3.50 |

*Mortise Shutter: (L. & P., O. S., Dixie, &c.)*

| No. | 1 | 1½ | 2 | 2½ |
|---|---|---|---|---|
| *Doz. pair* | $0.70 | .65 | .60 | .55 |

*Mortise Reversible Shutter, (Buffalo, &c.)*

| No. | 1 | 1½ | 2 |
|---|---|---|---|
| *Doz. pair* | $0.75 | .70 | .65 |

North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50 ..... 10%
Parker ..... 70@75%
Reading's Gravity ..... 75&10%
Sargent's, Nos. 1, 3, 5, 11 & 13 ..... 70&10@70&20%
Stanley's Steel Gravity Blind Hinges, ₩ doz. sets, without screws, $0.80; with screws, $1.15.
Wrightsville H'dware Co.:
O. S., Lull & Porter ..... 7 &5%
Acme, Lull & Porter ..... 75%
Queen City Reversible ..... 75%
Stenger's Positive Locking, Nos. 1 & 3 ..... 70&10%
Shepard's Noiseless, Nos. 60, 65, 55 ..... 70&10%
Niagara, Gravity Locking, Nos. 1, 3 & 5 ..... 75%
1868, Old Pat'n, Nos. 1, 3 & 5 ..... 75%
Tip Pat'n, Nos. 1, 3 & 5 ..... 75%
Buffalo Gravity Locking, Nos. 1, 3 & 5 ..... 75%
Shepard's Double Locking, Nos. 20 & 25 ..... 70%
Champion Gravity Locking, No. 75 .75%
Steamboat Gravity Locking, No. 10. 75%
Pioneer, Nos. 060, 45 & 5½ ..... 75%
Empire, Nos. 101 & 103 ..... 70%
W. H. Co.'s Mortise Gravity Locking, No. 2 ..... 60%

**Gate Hinges—**
*Clark's or Shepard's—Doz. sets:*

| No. | 1 | 2 | 3 |
|---|---|---|---|
| *Hinges with Latches* | $2.00 | 2.70 | 5.00 |
| *Hinges only* | $1.40 | 2.05 | 3.80 |
| *Latches only* | .70 | .70 | .35 |

*New England:*
*With Latch* ..... *doz* ....@$2.50
*Without Latch* ..... *doz.* ....@$1.80
*Reversible Self-Closing:*
*With Latch* ..... *doz.* ....@$1.80
*Without Latch* ..... *doz.* ....@$1.45
*Western:*
*With Latch* ..... *doz.* $1.80
*Without Latch* ..... *doz.* $1.20
Wrightsville H'dware Co.:
Shepard's or Clark's, doz. sets,

| No. | 1 | 2 | 3 |
|---|---|---|---|
| Hinges with Latches | $2.00 | 2.70 | 5.00 |
| Hinges only | 1.40 | 2.05 | 3.80 |
| Latches only | .70 | .70 | 1.35 |

**Spring Hinges—**
*Holdback, Cast Iron, gro. $7.00@10.00*
*Non-Holdback, Cast Iron gro $7@7.50*
Extra 5&10% often given.

J. Bardsley
Bardsley's Patent Checking ..... 15%
Bommer Bros.:
Bommer Ball Bring Floor Hinges 40%
Bommer Spring Hinges ..... 40%
Chicago Spring Butt Co.:
Chicago Spring Hinges ..... 25%
Triple End Spring Hinges ..... 50%
Chicago (Ball Bearing) Floor Hinge ..... 45%
Garden City Engine House .. 25%
Keene's Saloon Door ..... 25%
Columbian Hdw. Co.:
Acme, Wrt. Steel ..... 30%
Acme, Brass ..... 20&5%
American ..... 30%
Columbia, No. 14 ..... ₩ gr. $9.00
Columbia, No. 18 ..... ₩ gr. $25.00
Columbia, Adjustable, No. 7 ₩ gr. $12.00
Gem, new list ..... 30%
Clover Leaf ..... ₩ gr. $12.50
Oxford, new list ..... 30%
Hoffman Hinge & Foundry Co.: No. 70 & 80 Holdback Detachable $0.50
Lawson Mfg. Co.:
Machine ..... 35%
Matchless Pivot ..... 45%
Shelby Spring Hinge Co:
Crown Jamb Hinge ..... 40%
Chief Ball Bearing Floor Hinge. 45%
Royal Ball Bearing Floor Hinge.. 45%
The Stover Mfg. Co.:
Ideal, No. 16, Detachable, ₩ gr $12.50
Ideal, No. 4 ..... ₩ gr. $9.00
New Idea No. 1 ..... ₩ gr. $9.00
New Idea, Double Acting ..... 45%
Extra 10% often given on most of these Hinges.

**Wrought Iron Hinges—**
*Strap and T Hinges, &c., list Mar 15, 1901:*
*Light Strap Hinges* ..... 70%
*Heavy Strap Hinges* .. 75&10%
*Light T Hinges* ..... 66⅔%
*Heavy T Hinges* ..... 60&5%
*Extra Heavy T Hinges* .... 75%
*Hinge Hasps* ..... 55%
*Cor. Heavy Strap* ..... 75&10%
*Cor. Ex. Heavy T* ..... 75%
Extra 5&10&10@25&10&10%
*Screw Hook and Strap:* 6 to 12 in ..... lb. 3½c; 14 to 20 in ..... lb. 3½c; 22 to 36 in ..... lb. 3 c
*Screw Hook and Eye:*
¾ to 1 inch ..... lb. 5 c
½-inch ..... lb. 6 c
⅜-inch ..... lb. 7 c

**Miscellaneous—**
Hoffman's Steel Spring Butt Hinges .... 40&10%
Hoffman's Offset Refrigerator Hinges .. 40&10%

**Hitchers, Stall—**
Covert Mfg. Co., Stall Hitchers. ..... 35%

**Hods, Coal—**

| | 15 | 16 | 17 | 18 inch. |
|---|---|---|---|---|
| *Galv. Open* | $2.50 | 2.75 | 3.00 | 3.25 ₩ doz. |
| *Jap. Open* | $2.60 | 2.25 | 2.50 | 2.75 ₩ doz. |
| *Galv. Funnel* | $3.00 | 3.25 | 3.50 | 3.75 ₩ doz. |
| *Jap. Funnel* | $2.50 | 2.75 | 3.00 | 3.25 ₩ doz. |

**Masons, Etc.—**
Cleveland Wire Spring Co.:
Steel Mortar ..... each $1.45
Steel Brick ..... each $1.10
Hoffman's:
Brick ..... each $1.10
Masons' ..... each $1.00
Plasterers' ..... each $3.20

**Hoes— Eye—**
*Scovil and Oval Pattern* ..... 60&10%@60&10&10%
*Grub, list Feb. 23, 1899* ..... 70@70&10%

**Handled—**
*Aug. 1, 1899, List:*
*Garden* ..... 70&10%
*Meadow & Rhode Island* ..... 75&7½%
*Southern Meadow* ..... 75&5&2½%
*Mortar and Street* ..... 75&7½%
*Planters', Regular Pat'n* ..... 70&30%
*Cotton* ..... 75&7½%
*Toy, Ladies', Boys', Onion, Turnip, Berry or Tobacco* ..... 80&5%
Extra 60%
*Note.—Manufacturers and jobbers use a diversity of lists, and often sell at net prices.*
Ft. Madison Cotton Hoe ..... 75&7½%
Ft. Madison Crescent Cultivator Hoe, per doz ..... 75&10%
Ft. Madison Mattock Hoes:
Regular Weight ..... ₩ doz. $5.00
Junior Size ..... ₩ doz. $4.00
Ft. Madison Sprouting Hoe, ₩ doz. $4.00
Ft. Madison Dixie Tobacco Hoe. 75&20%
Kretsinger's Cut Easy ..... 70&10%
Warren Hoe ..... 60%
W. & C. Ivanhoe ..... 75&2%
B. B. Cultivator Hoe ..... 75&10&2%
Acme Weeding ..... 75&10&2%
W. & C. Lightning Shuffle Hoe, ₩ doz. $4.85

**Hoisting Apparatus—**
See *Machines, Hoisting.*

**Holders— Bit—**
Angular, ₩ doz. $24.00 ..... 45&10%

**Door—**
Empire ..... 50%

**File and Tool—**
Nicholson File Holders and File Handles ..... 33⅓%

**Hooks— Cast Iron—**
Bird Cage, Reading ..... 60%
Bird Cage, Sargent's List ..... 60%
Ceiling, Sargent's List ..... 40&10%
Clothes Line, Hoffman's ..... 40&10%
Clothes Line, Reading List ..... 65&10@65&10&10%
Clothes Line, Sargent's List. 50&20&10%
Coat and Hat, Sargent's List ..... 45&10%
Clothes Line, Stowell's ..... 70%
Coat and Hat, Stowell's ..... 70%
Coat and Hat, Reading ..... 70@75%
Coat and Hat, Wrightsville ..... 65%
Harness, Hoffman ..... per doz. 35@40c
Harness, Reading List ..... 70&10@75%

**Wire—**
*Belt* ..... 80%
*Wire Cut H. Hooks* .60&10@60&10&10%
Atlas, Coat and Hat:
Single Cases ..... 50%
10 Case Lots ..... 50&10%
Czar Harness ..... 50&10&5%

Wire Coat and Hat:
Acme.....60%
B. B.....60%
V Brace, Chief and Czar.....60%
Gem.....60%
Bright Wire Goods—See *Wire.*

### Wrought Iron—

*Box, 6 in., per doz. $1.00; 8 in., $1.25; 10 in., $2.50.*
*Cotton.....doz. $1.05@1.25*
Wrought Staples, Hooks, &c.—
See *Wrought Goods.*

### Miscellaneous—

*Bush, Light, doz. $5.50; Medium, $6.00; Heavy, $6.50*
*Grass.....Nos. 1 2 3 4*
*Best..... $1.50 1.75 2.00*
*Common.. $1.30 1.50 1.60*
*Potato and Manure.....60%@60%*
*Whiffletrees.....lb. 5½c*
*Hooks and Eyes:*
*Brass.....60c10c10@70%*
*Malleable Iron.....70c5@70c10%*
Covert Saddlery Works' Self Locking Gate and Door Hook.....60%
Ft. Madison Cut-Easy Corn Hooks, ₱ doz. $3.25 net
Crown Picture.....50&10%
Bench Hooks—See *Bench Stops.*
Corn Hooks—See *Knives, Corn.*

### Horse Nails—See *Nails, Horse*

### Horseshoes—

See *Shoes, Horse.*

### Hose Rubber—

*Garden Hose, ¾-inch:*
*Competition.....ft. 4¼@ 4¾c*
*3-ply Standard.....ft. 6 @ 6½c*
*4-ply Standard.....ft. 7½@ 8 c*
*3-ply extra.....ft. 8½@ 9 c*
*4-ply extra.....ft. 10½@11 c*
*Cotton Garden, ¾-in., coupled:*
*Low Grade.....ft. 6 @7 c*
*Fair quality.....ft. 8 @9 c*

## Irons—

### Sad—

*From 4 to 10.....lb 2¾@3c*
*B. B. Sad Irons.....lb. 3@3½c*
*Chinese Laundry.....lb. 4½@5c*
*Chinese Sad.....lb. 3½@4c*
*Mrs. Potts', per set:*
*Nos..... 50 55 60 65*
*Jap'd Tops....74c 74c 84c 84c*
*Tin'd Tops....77c 74c 87c 84c*
*New England Pressing, lb.. 3½@3¾c*

### Pinking—

*Pinking Irons.....doz. 50@60c*

### Soldering—

*Soldering Coppers 2¼ and 3...21@22*
*1¼ and 2.....23@24c*
Covert Mfg. Co.....20&2%

### Jacks, Wagon—

Covert Mfg. Co.:
Auto Screw.....30&5%
Steel.....45&2%
Covert's Saddlery Works':
Daisy.....60&10%
Victor.....60&10%
Lockport.....50%
Lane's Steel.....30&10%

## Kettles—

*Brass, Spun, Plain.....20@25%*
Enameled and Cast Iron—See *Ware, Hollow.*

### Knives—

### Butcher, Kitchen, &c.—

Foster Bros.' Butcher, &c.....30%
Hartzell Cutlery Co.....50%
Smith & Hemenway Co.....40&10%
Hay and Straw—See *Hay Knives.*

### Corn—

Withington Acme, ₱ doz., $2.65; Dent, $2.75; Adj. Serrated, $2.20; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15.

### Drawing—

*Standard List.....70&5@70c10%*
Bradley's.....
C. E. Jennings & Co. Nos. 45, 46..60&10%
Jennings & Griffin, Nos. 5 to 12..60&10&10%
Swan's.....70&10&2½c
Watrous.....16%&10%
L. & I. J. White.....20&5@25%

### Hay and Straw—

Lightning.....₱ doz. $6.50@7.00
Iwan's Sickle Edge.....₱ doz. $10.00
Iwan's Serrated.....₱ doz. $10.00
Maine.....₱ doz. $8.50

### Mincing—

Buffalo.....₱ gro. $13.00

### Miscellaneous—

*Farriers'.....doz. $2.00@3.00*
Woestenholm's.....₱ doz. $3.00 @3.25

### Knobs—

*Base, 2¼-inch, Birch, or Maple, Rubber tip, gro.....$1.10@1.20*
*Carriage, Jap, all sizes..gro. 25@50c*
*Door, Mineral.....doz. 65@70c*
*Door, Por. Jap'd.....doz. 70@75c*
*Door, Por. Nickel.....doz. $2.05@2.15*
Bardsley's Wood Door, Shutter, &c...15%
Picture, Sargent's.....60&10%

## Lacing Leather—

See *Belting Leather—*

### Ladders Step Etc.—

Lane's Store.....25%
Myers Noiseless Store Ladders.....50%

### Ladies—Melting—

L. & G. Mfg. Co.....25%
P. S. & W.....50%
Reading.....60%
Sargent's.....45&10%

### Lanterns—Tubular—

*Regular Tubular No. 0, doz. $4.35@4.75*
*Lift Tubular...No. 0...doz. $5.75@6.25*
*Hinge Tubular..No. 0...doz. $4.75@5.25*
*Other Styles.....40c10@40c10c5%*

### Bull's Eye Police—

*No. 1 2¾ inch.....$2.50@2.75*
*No. 2, 3 inch.....$2.75@3.00*

### Latches—Gate—

Hoffman's Safety Gate.....₱ doz. 60c

### Thumb—

*Roggin's Latches, w. lasc rew. dz35@40c*

### Leaders—Cattle—

*Small.....doz. 55c; large, 60c*
Covert Mfg. Co.....45&2%

### Lifters, Transom—

R. & E.....33⅓%

### Lines—

*Wire Clothes, Nos... 18 19 20*
*100 feet.....$2.20 2.00 1.65*
*75 feet.....$1.80 1.70 1.30*
Ossawan Mills.
Crown Solid Braided Chalk.....33⅓%
Mason's, No. 0 to No. 5.....33⅓%
Samson Cordage Works:
Solid Braided Chalk, No. 0 to 3.....40%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ₱ gr.....30%
Anniston Waterproof Clothes, 53 ft., ₱ gro.: $22.00; Gilt Edge, $20.00; Air Line $20.00; Acme, $15.00; Alabama, $15.00; Empire, $13.50; Advance, $13.50; Alliston, $11.50; Calhoun, $10.00; Oriole, $20.00; Albermarle, $25.50; Eclipse, $11.00; Chicago, $10.00; Standard, $9.00; Columbia, $8.00.

### Locks—Cabinet—

*Cabinet Locks.....33⅓%@33⅓&7½%*

### Door Locks, Latches, &c.—

[Net prices are very often made on these goods.]
Reading Hardware Co.....50%
R. & E. Mfg. Co.....40%
Sargent & Co.....40@40&10%

### Elevator—

Stowell's.....40%

### Padlocks—

*Wrought Iron.....75&10c65@80c5%*
R. & E. Mfg. Co. Wrt. Steel and Brass.....75@75&10%

### Sash, &c.—

Ives' Patent,:
Bronze and Brass.....55&7½%
Crescent.....50%
Iron.....60&3½%
Wrought Bronze and Brass.....50&5%
Wrought Steel.....55%
Reading.....60&10&10@70%

## Machines—Boring—

*Com., Upright, Without Augers..$2.00*
*Com., Angular, Without Augers..$2.25*
Without Augers.

| | Upright. | Angular. |
|---|---|---|
| R. & E. Mfg. Co.: | | |
| Improved No. 3 | $4.25 | No. 1 $5.00 |
| Improved No. 4 | 3.75 | No. 2 3.38 |
| Improved No. 5 | 2.75 | |
| Jennings' | No. 4, 3.15 | No. 1, 3.50 |
| Millers' Falls | | 5.75 |
| Snell's, Rice's Pat. | 2.50 | 2.75 |

### Hoisting—

Moore's Anti-Friction Differential Pulley Block.....30%
Moore's Hand Hoist, with Lock Brake.20%
Moore's Portable Pneumatic Hoist....35%

### Ice Cutting—

Chandler's.....15&10%

### Washing—

| Boss Washing Machine Co.: | Per doz. |
|---|---|
| Boss No. 1; Boss Rotary | $57.00 |
| Boss No. 7; Dietz Rotary | 80.00 |
| Champion Rotary; Banner No. 1 | 54.00 |
| Standard Champion No. 1 | 48.00 |
| Standard Perfection | 36.00 |
| Cinti Square Western | 30.00 |
| Uneeda American, Round | 29.00 |

### Mallets—

*Hickory.....45&5@50%*
*Lignumvitæ.....45c5@50%*
*Tinners', Hickory and Applewood, doz.....50@55c*

### Mats—Door—

Elastic Steel (W. G. Co.).....10%

### Mattocks—

See *Picks and Mattocks.*

### Menders Hose

Robinson's Hose Menders.....₱ gro, $2.00

### Milk Cans—See *Cans, Milk*

### Mills—Coffee, etc.—

Enterprise Mfg. Co.....25@30%
Hoffman's Side, Coffee and Spice.....₱ doz. $1.25
National, list Jan. 1, '04.....30%
Parker's Columbian & Victoria.50&10@60%
Parker's Box and Side.....50&10@60%
Sun. No. 1080, 1 h mill.....₱ doz $3.00
Swift's, Lane Bros Co.....30%

### Mowers, Lawn—

*Net prices are generally quoted.*
*Cheap.....all sizes. $1.90@1.95*
*Good.....all sizes, $2.25@2.50*

| | 10 | 12 | 14 | 16-inch |
|---|---|---|---|---|
| *High Grade* | 4.25 | 4.50 | 4.75 | 5.00 |

Continental.....60&10%
Great American.....7 %
Great American Ball Bearing.....60&10%
Quaker City.....70%
Pennsylvania.....40&10%
Pennsylvania Ball Bearing.....60&5%
Pennsylvania Golf.....50%
Pennsylvania Horse.....40%
Pennsylvania Pony.....45%
Philadelphia:
Styles M., S., C., K., T.....70&10%
Style A, all Steel.....65&10%
Style E, High Wheel.....70&10&5%
Drexel and Gold Coin, low list...50&5%

## Nails—

*Cut and Wire. See Trade Report.*
*Wire Nails and Brads, Papered. List July 20, 1899.....*
*85c10c10@85c10c10c10%*
*Hungarian, Finishing, Upholsterers', &c. See Tacks.*

### Horse—

| Nos. | 6 | 7 | 8 | 9 | 10 | |
|---|---|---|---|---|---|---|
| A. C. | 25c | 23c | 22c | 21c | 21c | 40&5% |
| Ausable | 25c | 25c | 22c | 21c | 21c | 40% |
| C. B. K. | 25c | 25c | 22c | 21c | 21c | 40% |
| Champion | 28c | 26c | 25c | 24c | 23c | 40&10&5% |
| Clinton | 19c | 17c | 16c | 15c | 14c | 30&10&5% |
| Maud S. | 25c | 23c | 22c | 21c | 21c | 50% |
| Putnam | 23c | 21c | 20c | 19c | 18c | 33⅓% |
| Putnam | | | | | | |
| Cold Rol'd | 19c | 18c | 17c | 16c | .. | 10&10% |
| American, Nos. 5 to 10 | | | | | | ₱ lb 9c@9½c |
| Neponset | Nos. 5 to 10c | | | | | ₱ lb 12c |

*Jobbers' special brands...per lb. 8@9c*

### Picture

| | 1½ | 2 | 2½ | 3 | 3½ in. |
|---|---|---|---|---|---|
| *Brass Head.* | .65 | .69 | .70 | .95 | 1.00 gro. |
| *Por. Head.* | .. | 1.10 | 1.10 | 1.10 | .. gro. |

Crown Picture Nails.....₱ gro. $1.50

### Nippers, See *Pliers and Nippers.*

### Nuts—

*Cold Punched: Off list.*
*Mfrs. or U. S. Standard.*
*Square, plain.....$4.50*
*Hexagon, plain.....$4.60*
*Square, C. T. & R.....$4.70*
*Hexagon, C. T. & R.....$5.00*
*Hot Pressed:*
*Mfrs., U. S. or Nar. Gauge Stan'd.*
*Square Blank.....$4.80*
*Hexagon Blank.....$5.00*
*Square Tapped.....$4.60*
*Hexagon Tapped.....$4.80*

## Oakum—

*Best or Government.....lb. 6¼c*
*Navy.....lb. 4¾c*
*U. S. Navy.....lb. 5¾c*
*Plumbers' Spun Oakum.....2¾c*
*In carload lots ¼c lb. off f. o. b. New York.*

### Oil Tanks—See *Tanks, Oil.*

### Oilers—

*Brass and Copper.....65@65c10%*
*Tin or Steel.....70c10@75%*
*Zinc.....75@75c10%*
*Chase or Paragon:*
*Brass and Copper.....65c5@65c10%*
*Tin or Steel.....75@75c10%*
*Zinc.....76@76c10%*
Malleable, Hammers' Improved, No. 1, $3.60; No. 2, $4; No. 3, $4.40 ₱ doz. 20%
Malleable, Hammers' Old Pattern, same list.....50&10%
Ame ican Tube & Stamping Co.:
Spring Bottom Cans.....70@70&10%
Railroad Oilers etc,.....60@60&10%

### Openers—Can—

*French.....doz. 35c*
*Iron Handle.....doz. 25@27c*
*Sprague, Iron Hdle..per doz. 35@40c*
*Sardine Scissors...doz. $1.75@3.00*
Marvel.....per doz. $1.25
National.....50%
Stowell's.....per doz. 35@45c
Tip Top.....per doz. $0.75

### Egg—

Nickel Plate.....per doz., $2.25
Silver Plate.....per doz., $3.50

## Packing—

*Asbestos Packing, Wick and Rope, 15@15½c lb.*

### Rubber—

*Sheet, C. I.....8@12c*
*Sheet, C. O. S.....9@13c*
*Sheet, C. B. S.....10@14c*
*Sheet, Pure Gum.....50@70c*
*Sheet, Red.....35@40c*
Jenkins' Standard, ₱ lb 80c....25@25&5%

### Miscellaneous—

*American Packing.....7@10c lb.*
*Cotton Packing.....13@14c lb.*
*Italian Packing.....9@12c lb.*
*Jute.....3½@4c lb.*
*Russia Packing.....7@11c lb.*

### Pails—Creamery

S. S. & Co., with gauges.. No 1 $6.25; No. 2, $5.50 ₱ doz.

### Galvanized—

Price per doz.

| | *Quart.* | *10* | *12* | *14* |
|---|---|---|---|---|
| *Water, Regular* | .. | 1.75 | 2.00 | 2.25 |
| *Water, Heavy* | .... | 2.75 | 3.00 | 3.25 |
| *Fire, Rd. Bottom,* | | 2.50 | 2.60 | 2.80 |
| *Well* | ..... | 2.25 | 2.50 | 2.75 |

### Pans—Dripping—

*Standard List.....60c5@60c10%*

### Fry—

*Common Lipped:*

| *No.* | *1* | *2* | *3* | *4* | *5* |
|---|---|---|---|---|---|
| *Per doz.* | *$0.95* | *1.05* | *1.15* | *1.30* | *1.65* |

### Roasting and Baking—

Regal, S. S. & Co., ₱ doz., Nos. 5, $4.50; 10 $5.25; 20, $5.75; 30, $6.25.
Simplex, ₱ doz.:

| No. | 40 | 50 | 60 | 140 | 150 | 160 |
|---|---|---|---|---|---|---|
| | $2.75 | 3.25 | 3.75 | 3.00 | 3.25 | 4.00 |

### Paper—Building Paper—

| | *lb.* |
|---|---|
| *Asbestos:* | |
| *Building Felt* | 2¾c |
| *Mill Board, sheet, 40 x 40 inches* | 3½c |
| *Mill Board, roll, thicker than 1-16 inch* | 3¼c |
| *Mill Board, roll, 1-16 in. thick and less* | 2½c |
| | *Per roll* |
| *Rosin Sized Sheathing:* | *500 sq. ft.* |
| *Light wt., 25 lbs. to roll* | $0.45@0.50 |
| *Medium wt., 30 lbs. to roll* | $0.58@0.65 |
| *Heavy wt., 40 lbs. to roll* | $0.68@0.75 |
| *Black Water Proof Sheathing, 500 Sq ft., 1 ply, 65c; 2 ply, 85c; 3 ply, $1.10; 4 ply, $1.25.* | |
| *Deafening Felt, 9, 6 and 4½ sq. ft. to lb., ton* | $45.00 |
| *Red Rope Roofing, 250 sq. feet per roll* | $1.65 |

NOTE.—*These goods are often sold at delivered prices.*

### Tarred Paper.

*1 ply (roll 200 sq. ft.), ton..$32.50@35.00*
*2 ply, roll 108 sq. ft.....60@65c*
*3 ply, roll 108 sq. ft.....82@87c*
*Slater's Felt (roll 500 sq. ft.).....75c*
NOTE.—*Above prices often include delivery.*
R. R. M. Stone Surfaced Roofing (roll 110 sq. ft.).....$2.75

### Sand and Emery—

*Flint.....60@60c10%*
*Garnet.....25@30@15%*

### Parers—Apple—

| | |
|---|---|
| Advance | ₱ doz. $4.50 |
| Baldwin | ₱ doz. $5.00 |
| Bonanza Improved | each $6.50 |
| Dandy | each $7.50 |
| Eureka Improved | each $20.00 |
| Family Bay State | ₱ doz. $15.00 |
| Improved Bay State | ₱ doz. $36.00 |
| New Lightning | ₱ doz. $7.50 |
| Reading 72 | ₱ doz. $4.00 |
| Reading 78 | ₱ doz. $7.00 |
| Turn Table '98 | ₱ doz. $6.75 |
| White Mountain | ₱ doz. $6.00 |

### Potato—

Saratoga.....₱ doz. $7.00
White Mountain.....₱ doz. $6.00

### Paris Green—

*Less than 1 to 5.....per lb.*
*Arsenic kegs or casks.....12½c*
*Kegs, 100 to 175 lbs.....13 c*
*Kits, 14, 28, 56 lbs.....14 c*
*Paper boxes, 2 to 5 lbs.....14 c*
*Paper boxes, 1 lb.....14½c*
*Paper boxes, ½ lb.....15 c*
*Paper boxes, ¼ lb.....16 c*
*1 to 5 tons, 1 cent per lb. less: 5 tons and over, 1½ cents per lb. less.*

### Picks and Mattocks—

*List Feb. 23, 1899.....65c10@70%*

### Pinking Irons—

See *Irons, Pinking.*

### Pins—Escutcheon—

*Brass.....60@60c10%*
*Iron, list Nov. 11, '85.....60@60c10%*

### Pipe, Cast Iron Soil—

*Standard, 2-6 in.....50c10%*
*Extra Heavy, 2-6 in.....65%*
*Fittings.....70%*

### Pipe, Merchant,

*Steel or Iron, Carload Lots,*

| *Merchant Pipe.* | *f.o.b. Pittsburgh. Black,* | *Galvanized.* |
|---|---|---|
| *⅛, ¼, ⅜ inch* | 68% | 58% |
| *½ inch* | 70% | 60% |
| *¾ to 6 inch* | 75% | 65% |
| *7 to 12 inch* | 73% | 63% |

*Less than carloads, 12½% advance.*

### Pipe Sewer—

*Jobbers' Prices—*

| | |
|---|---|
| *Standard Pipe and Fittings, 3 to 24 in.* | |
| *New England* | 70% |
| *New York and New Jersey* | 73% |
| *Maryland, Delaware, East Penn.* | 75% |
| *West Penn and West Va.* | 76% |
| *Virginia* | 78% |
| *Ohio, Michigan and Ky.* | 78% |

*Carload lots are generally delivered.*

### Pipe, Stove—

| Edwards' Nested Stove Pipe: | C. L. | L. C. L. |
|---|---|---|
| 5 in., per 100 joints | $7.50 | $8.50 |
| 6 in., per 100 joints | 8.00 | 9.00 |
| 7 in., per 100 joints | 9.00 | 10.00 |

### Planes and Plane Irons—

### Wood Planes—

*Bench, First quality....40c5@40c10%*
*Bench, Second qual.....60c5@50c10%*
*Molding.....33⅓c5@33⅓c10%*
Bailey's (Stanley R. & L. Co) 5&10&25&10&10%
Chapin-Stephens Co.:
Bench, First Quality.....40@40&10%
Bench, Second Quality.....50&5&10%
Molding.....33⅓@33⅓&10%
Toy and German.....40@40&10%
Gage Self Setting.....35%
Union.....60%

### Iron Planes—

Bailey's (Stanley R. & L. Co) 25&10@25&10&10%
Chapin's Iron Planes.....50&10%
Miscellaneous Planes (Stanley R. & L. Co.).....20&10@20&10&10%
Sargent's.....60%
Union.....60%

### Plane Irons—

*Wood Bench Plane Irons.....30c5@30c10%*
Buck Bros.....30%
Chapin-Stephens Co.....30@30&10%
Stanley R. & L. Co...20&10@20&10&10%
L. & I. J. White.....20&5@25%

### Planters, Corn, Hand.

Kohler's Eclipse.....₱ doz. $8.50

### Plates—

*Felloe.....lb. 3¼@4c*
Self-Sealing Pie Plates (S. S. & Co.), ₱ doz. $2.00.....50%

### Pliers and Nippers—

*Button Pliers.....75@75c10%*
*Gas Burner, per doz., 5 in., $1.15@ $1.20; 6 in., $1.35@$1.45*
*Gas Pipe..* 7 8 10 12-in.
*$1.75 $2.00 $2.75 $3.75*
Acme Nippers.....50@50&5%
Bernard's:
Parallel, Pliers.....45%
Paragon Pliers.....50&5%
Lodi Pliers.....50&5%
Elm City Fence Pliers.....35%
Cronk & Carrier Mfg. Co.:
American Button.....75&10%
Cronk's.....60%
Improved Button.....70&10%
Stub's Pattern.....50%
Combination and others.....33⅓%
Heller's Farriers' Nippers, Pincers, and Tools 40&10@40& 0&10%
P., S. & W. Tinners' Cutting Nippers, 30@30&10%
Swedish Side, End and Diagonal Cutting Pliers.....50%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds.....40%

### Plumbs and Levels—

Chapin Stephens Co.:
Plumbs and Levels.....30@30&10&10%
Chapin's Imp. Brass Cor 40@40&10&10%
Pocket Levels.....30@30&10&10%
Level Glasses.....60@60&10&10%
Disston's Plumbs and Levels.....70%
Disston's Pocket Levels.....70%
C. E. Jennings & Co.'s Iron.....25&10%
C. E. Jennings & Co.'s Iron, Adjustable.....33⅓&10%
Stanley R. & L. Co ...30&10@30&10&10%

Stanley's Duplex.....20@20&10&10%
Woods' Extension.....33⅓&5

### Poachers, Egg—

Buffalo Steam Egg Poachers, ₱ doz., No. 1, $4.50; No. 2, $ .00; No. 3, $ .00; No. 4, $12. 0.....50&

### Points, Glaziers'—

*Bulk and 1 lb. papers..lb.* 3½c@..
*½-lb. papers.....lb.* 9 c@..
*¼-lb. papers.....lb.* 9½c@..

### Pokes, Animal—

Ft. Madison Hawkeye.....₱ doz. $3.25
Ft. Madison Western.....₱ doz. $4.00

### Police Goods—

*Manufacturers' Lists.....25@25&5%*
Tower's.....25%

### Polish—Metal—

Prestoline Liquid, No. 1 (¼ pt.), ₱ doz. $3.00; No. 2 (1 qt.), $9.72.....40%
Prestoline Paste.....40&10%
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ₱ doz. 50¢; ₱ gr. $4.50; ½ ℔ boxes, ₱ doz. $1.25; 1 ℔ boxes, ₱ doz. $2.25.
U. S. Liquid, 8 oz. cans, ₱ doz. $1.25; ₱ gr. $12.00.
Barkeepers' Friend Metal Polish, ₱ doz. $1.75; ₱ gr. $18.00.
Wynn's White Silk, ¼ pt. cans, ₱ doz.....$2.00

### Stove—

Black Eagle Benzine Paste, 5 ℔ cans .. ₱ ℔ 10¢
Black Eagle, Liquid, ½ pt. cans ₱ doz. 75¢
Black Jack Paste, ¾ ℔ cans, ₱ gr. $9.00
Ladd's Black Beauty, gr. $10.00.....50%
Joseph Dixon's, ₱ gr. $5.75.....10%
Dixon's Plumbago.....₱ ℔ 8¢
Fireside.....₱ gr. $2.50
Gem, ₱ gr. $4.50.....10%
Japanese.....₱ gr. $3.50
Jet Black.....₱ gr. $3.50
Peerless Iron Enamel, ¼ pt. cans..... ₱ doz. $1.50
Wynn's:
Black Silk, 5 ℔ pail.....each 70¢
Black Silk, ½ ℔ box.....₱ doz. $1.00
Black Silk, 5 oz. box.....₱ doz. $0.75
Black Silk, ½ pt. liq.....₱ doz. $1.00

### Poppers, Corn—

*1 qt., Square.....gro. $9.00*
*1 qt., Round.....gro. $10.00*
*1½ qt., Square.....gro. 11.00*
*2 qt., Square.....gro. 13.00*

### Post Hole and Tree Augers and Diggers—

See also *Diggers, Post Hole, &c.*

### Posts, Steel—

Steel Fence Posts, each, 5 ft., 42¢; 6 ft., 46¢; 6½ ft., 48¢.
Steel Hitching Posts, each.....$1.30

### Potato Parers—

See *Parers, Potato.*

### Pots— Glue—

*Enameled*.....40%
*Tinned*.....35%

### Powder—

*In Canisters:*
*Duck, 1 lb. each*.....45c
*Fine Sporting, 1 lb. each*.....75c
*Rifle, ½-lb. each*.....15c
*Rifle, 1-lb. each*.....25c
King's Semi-Smokeless:
Keg (25 ℔ bulk).....$6.50
Half Keg (12½ ℔ bulk).....$3.50
Quarter Keg (6¼ ℔ bulk).....$1.90
Case 24 (1 ℔ cans bulk).....$8.50
Half case (1 ℔ cans bulk).....$4.50

| King's Smokeless: | Shot Gun | Rifle |
|---|---|---|
| Keg (25 ℔ bulk) | $12 00 | $15.00 |
| Half Keg (12½ ℔ bulk) | 6.25 | 7.75 |
| Quarter Keg (6¼ ℔ bulk) | 3.25 | 4.00 |
| Case 24 (1 ℔ cans bulk) | 14.00 | 17 00 |
| Half case 12 (1 ℔ cans blk) | 7.25 | 8 75 |

Robin Hood Shot Gun.....50&20%

### Presses—Fruit and Jelly—

Enterprise Mfg. Co.....20@25%
Sensible.....33⅓&5
2 qt., $2.00; 4 qt., $4.00; 10 qt., $6.00 each.

### Seal Presses—

Morrill's No. 1, per doz. $20.00.....50%
Morrill's No. 2, per doz. $22 50.....50%

### Pruning Hooks and Shears—See *Shears.*

### Pullers Nail—

Cyclops.....50%
Miller's Falls, No. 3, per doz. $12.00..... 33⅓&10%
Pearson No. 1, Cyclone Spike Puller, each $37.50.....50%
Pelican, ₱ doz. $9.00.....40&10%
Scranton, Case Lots:
No. 1 (large), ₱ doz. $6.50; No. 2 (large), $5.75; No. 3 (small), $5.00; No. 2-B (large), $5.50; No. 3-B (small), $4.00; No. 2-D (large), $4 50; No. 3-D (small) $4.00.
Smith & Hemenway Co.:
Ajax.....60%
Diamond B, No. 2, case lots, ₱ doz $6.00
Diamond B, No. 3, case lots, ₱ doz $5.50
Eureka.....50%
Giant, No. 1, ₱ doz. $18; No. 2, $16.50; No. 2, $15.....40%
Yankee.....50&5%

### Pulleys—Single Wheel—

| Inch | 2 | 2¼ | 3 |
|---|---|---|---|
| *Awning ..doz* | *$0.50* | .75 | *1.00* |

*Hay Fork, Swivel or Solid Eye..... doz., 4 in., $0.95; 5 in., $1.25*

| *Inch* | 2 | 2¼ | 2½ |
|---|---|---|---|
| *Hot House, doz* | *$0.60* | .80 | *1.10* |
| *Inch* | 1¼ | 1¾ | 1¾ | 2 |
| *Screw.....doz.* | *$0.14* | .17 | .20 | .26 |
| *Inch* | 1¾ | 2 | 2¼ | 2½ |
| *Side.....doz.* | *$0.37* | .35 | .48 | .55 |
| *Inch* | 1¼ | 1¾ | 2 | 2½ |
| *Tackle.....doz.* | *$0.47* | .57 | .50 | .59 |

Stowell's:
Ceiling or End, Anti-Friction.....60%
Dumb Waiter, Anti-Friction..60&10%
Hay Fork, Anti-Friction, 5-in. Wheel, ₱ doz. $12.00..... 50%
Electric Light.....65%
Side, Anti-Friction.....0&1.%

### Sash Pulleys—

*Common Frame; Square or Round End, per doz., 1¼ in., 13c; 2 in., 16c*
*Auger Mortise, no Face Plate, per doz. 1¼ in., 12c.; 2 in., 15c.*
*Auger Mortise, with Face Plate, per doz., 1¼ in., 13c.; 2 in., 15½c.*
Acme.....1¼ in., 16c; 2 in., 19¢
Common Sense, 1¼ in.... ₱ doz., 18¢; 2 in., 20¢.
Fox-All-Steel, Nos. 3 and 7, 2¼ in. ₱ doz 25¢
No. 9, 1¾ in.....₱ doz. 20¢
Extra for Plated Finish...₱ doz. 20¢
Extra for Anti-Friction Bronze Bushing.....₱ doz 10¢
Grand Rapids All Steel Noiseless...40%
Ideal No. 13.....1¾ in.. ₱ doz.. 16¢
Niagara.....1¾ in., 16c; 2 in. 19c
No. 26, Troy.....1¾ in., 14½c; 2 in., 16½c
Star.....1¾ in., 16¢; 2 in., 19¢
Tackle Blocks—See *Blocks.*

### Pumps—

*Cistern*.....60@60&10%
*Pitcher Spout*.....75c&10@80%
*Wood*.....50@50&10%
*Pump Leathers, Lower and Plunger Valves—Per gro.:*

| *Inch..* | 2 | 2¼ | 2½ | 2¾ |
|---|---|---|---|---|
| | *$2.20* | *2.50* | *2.75* | *3.00* |

| *Inch..* | 3 | 3¼ | 3½ | 3¾ | 4 |
|---|---|---|---|---|---|
| | *$3.30* | *3.60* | *3.85* | *4.10* | *4.40* |

Barnes Dbl. Acting (low list).....50%
Contractors' Rubber Diaphragm No. 2 B. & L. Block Co.....$16.00
Flint & Walling's Fast Mail (low list).55%
Flint & Walling's Pitcher Spout.....75%
Loud's Suction Pumps, U. H. Co.....20%
Myer's Pumps, low list.....50%
Myers' Power Pumps.....50%
Daisy Spray Pump.....₱ doz. $7.50
Myers' Spray Pumps.....50&10%

### Punches—

*Saddlers' or Drive, good...doz. 65@70c*
*Spring, single tube, good quality... $1.75@2.00*
*Revolving (4 tubes)...doz. $3.75@4.00*
Bemis & Call Co.'s Cast Steel Drive....50%
Bemis & Call Co.'s Check.....55%
Bemis & Call Co.'s Spring.....50%
Morrill's No. 1 (A.B.C.), ₱ doz., $15.00..50%
No. 2, ₱ doz. $22.50.....50%
No. 2, Metal, ₱ doz., $45.00.....50%
Bench Punch, each, $ 00.00.....50%
Niagara Hollow Punches.....40%
Niagara Solid Punches.....55&10%
Steel Screw, B & K. Mfg. Co.....40%
Tinners' Hollow, P., S. & W. Co.35@35&5%
Tinners' Solid, P., S. & W. Co., ₱ doz., $1.44.....60%

### Rail— Barn Door, &c.—

*Cast Iron, Barn Door: Flange Screw Holes for Rd. Groove Wheels:*

| ½ | ⅝ | ¾ | In. |
|---|---|---|---|
| *$1.70* | *$2.10* | *$3.00* | *100 feet.* |

*Angular for Sq. Groove Wheels:*

| *Small* | *Med.* | *Large.* | |
|---|---|---|---|
| *$1.60* | *1 95* | *2.70* | *100 feet.* |

*Sliding Door, Brnzed Wr't Iron, ft. 6½c*
*Sliding Door, Iron Painted....2½@3c*
*Sliding Door, Wrought Brass, 1⅛ in.....lb. 36c...50%*
Allith Mfg. Co. Reliable Hanger Track ₱ foot.....10¢
Cronk's Double Braced Steel Rail, ₱ foot.....3½¢
Cronk's O. N. T. Rail.....3½¢
Lanes' O. N. T., ₱ 100 ft., 1 inch, $3.10; 1¼ inch, $4.90; 1½ inch, $4.85.
Lanes' Standard, ₱ 100 ft.....3.75
Lawrence Bros.'.....₱ ft. 4½¢
Lawrence Bros. New York.....3½¢
McKinney's Hinged Hanger Rail ₱ foot, 11¢.....50%
McKinney's None Better.....₱ ft. 3½¢
McKinney's Standard.....₱ ft. 4 ¢
Myers' Stayon Track.....50&10%
Smith's Wrought Bracket, Plain.....3½¢
Smith's Special.....4½¢
Smith's Never Jump, per ft. 11¢.....50%
Smith's Plain Steel.....30%
Smith's Milled Steel.....4½¢
Stowell's Cast Rail.....1½¢
Stowell's Steel Rail, Plain.....25%
Stowell's Wrought Bracket, Plain.....3½¢
Swett's Hylo, per ft. 11¢.....50&10%
Swett's P. L. B. Steel Rail, ₱ 100 ft. $3.00

### Rakes—

*Net Prices, Malleable Rakes:*

| | *10* | *12* | *14* | *16-tooth* |
|---|---|---|---|---|
| *Shank* | *$1.50* | *1.60* | *1.75* | *1.85* |
| *Socket* | *$1.65* | *1.80* | *1.95* | *2.10* |

*Steel. August 1, 1899, List...70&5&20%*
*Malleable.....70&10@75&5%*
*Lawn Rakes, Metal Head, per doz., 20 teeth.....$3.25@3.50*
*24 teeth.....$3.50@3.75*
Fort Madison Red Head Lawn.....$3.25
Fort Madison Blue Head Lawn.....$3.00
Jackson Lawn, 29 and 30 teeth, ₱ doz $4.00
Kohler's:
Lawn Queen, 20-tooth, ₱ doz.....$3.45
Lawn Queen, 24-tooth, ₱ doz.....$3.60
Paragon, 20-tooth, ₱ doz.....$2.75
Paragon, 24-tooth, ₱ doz.....$3.00
Steel Garden, 14-tooth, ₱ doz.....$2.90
Malleable Garden, 14-tooth, ₱ doz..$2.00

### Rasps, Horse—

Disston's.....75%
Heller Bros.....70&5&20&10&5%
McCaffrey's American Standard..... 60&10&5%
New Nicholson.....50&10%
See also *Files.*

### Razors—

Borasic.....60 & 10%
Fox Razors, No. 42...₱ doz. $30.00 } 25
Fox Razors, No. 44, ₱ doz. $36.00 } &
Fox Razors, No. 85, Platina, ₱ doz. } 5
.....5 0
Red Devil.....0%
Silbermine:
Carbo Magnetic.....$13.00
Griffon, No. 65.....$15.00
Griffon, No. 66.....$12.00
All other razors.....40%
Safety ir razors.....40%

### Safety Razors—

New Gem, in Tin Boxes.....₱ doz. $12.00
New Gem, Extra Blades.....₱ doz. $8.35
Gem Outfits (Razor, Strop, etc.)..... ₱ doz. $ 5.60
Complete Razor, extra Blade in Leather Case.....₱ doz. $27.00

### Reels— Fishing—

Bishop's Independent Fish Reel Spooler, ₱ doz.....$30.00
Hendryx:
M 6, Q 6, A 6, B 6, M 9½, 4008, Silver Rubber Populo, Nickeled Populo, Aluminum, German Silver, Bronze, 3-0 4 N, 6 N, 4 N to 8 PN.....33⅓&5
6 RW, 102 P and RN, 202 P and PN.40%
G 9.....20%
24 N to 28 PN.....35&10&10%
124 N, 974 PN, 002904 PN, 1020 R and PRN, 202 PR and PRN....50&5%
2904 N.....40&10&5%
5009 PN and N.....50%
2904 P.....50&10&5%
2904 PN.....60%
0924 N.....40&10%
02084 N.....45&12½&5%
Single Action Trout.....40&10%
986 P N, 802 and 802 N.....50&10%
Competitor, 304 and 304 PN.....35%
0304 P and PN.....40&5%
Safety and Salmon.....30%

### Registers—*List Sept. 2, 1901.*

*Black Jap*.....
*White Jap*.....
*Bronzed*.....
*Nickel Plated*.....
*Electro Plated*.....
} *7&6&10 @80%*

*There is a good deal of irregularity in prices of Registers.*

### Registers, Cash—

Sun, No. 1½, Metal Cabinet.....$30.00
Sun, No. 10, Wood Cabinet.....$35.00

### Revolvers—

*Single Action*.....85@90c
*Double Act n, except 44 cal..$1.35@1.50*
*Double Action, 44 caliber..$1.60@1.65*
*Automatic*.....*$2 75@3.00*
*Hammerless*.....*$3.25@3.60*

### Riddles, Grain or Sand—

*16 in., per doz*.....*$2.75@3.00*
*17 in., per doz*.....*$3.00@3.25*
*18 in., per doz*.....*$3.25@3.50*

### Rings and Ringers—Bull Rings—

| | *2* | *2¼* | *3 Inch.* |
|---|---|---|---|
| *Steel* | *$0.70* | *0.75* | *0.80 doz.* |
| *Copper* | *1.00* | *1.10* | *1.35 doz.* |

### Hog Rings and Ringers—

*Hill's Rings....gro. boxes, $4.75@4.50*
*Hill's Ringers, Gray Iron. doz. 55@60c*
*Hill's Ringers, Mal. Iron, doz. 75@80c*
*Blair's Rings.....per gro. $5.00@5.25*
*Blair's Ringers...per doz. $0.60@ .65*
*Brown's Rings....per gro. $5.50@5.75*
*Brown's Ringers...per doz. $0.75@1.00*

### Rivets and Burrs—

*Copper*.....50¢&10@50¢&10¢&5%
*Iron or Steel:*
*Tinners'*.....75@75¢&10%
*Miscellaneous*.....75@75¢&10%

### Rollers—

Acme, Stowell's Anti-Friction.....50%
Barn Door, Sargent's list.....60%
Cronk's Stay.....66⅔&5%
Cronk's Brinkerhoff.....66⅔%
Lane's Stay.....33⅓&5%
Stowell's Barn Door Stay.....₱ doz. $1.25

### Rope—

*Manila, 7-16 in. and larger, tarred or untarred...lb. 11 @11½c*
*Manila, 5/16-inch...lb. 11½@12 c*
*Manila, ¼ & 5-16 in....lb. 12 @12½c*
*Manila, Hay, Hide and Bale Ropes, Medium and Coarse.....lb. 12 @12½c*
*Sisal, 7-16 in. and larger lb. 8 @10 c*
*Sisal, ⅜-inch.....lb. 8½@10½c*
*Sisal, ¼ and 5-16 Inch..lb. 9 @11 c*
*Sisal, Hay, Hide and Bale Ropes, Medium and Coarse.....lb. 8 @10 c*
*Sisal Tarred, Medium Lath Yarn.....lb. 7½@ 9½c*
*Cotton Rope:*
*Best....¼-in. and larger, lb. 13½c*
*Medium..¼-in. and larger, lb. 11 c*
*Com....¼-in. and larger, lb. 9 c*
*Jute Rope:*
*Thread No. 1, ¼-in. and up, lb. 6½c*
*Thread No. 2, ¼-in. and up, lb. 6 c*
*Yarn, ¼-in. and up.. lb. 5 @5½c*
Old Colony Manila Transmission Rope, ₱ ft. 17½¢

### Wire Rope—

*Galvanized*.....40¢&5%
*Plain*.....45¢&5%

### Ropes, Hammocks—

Covert Mfg. Co.:
Jute.....40&5%
Sisal.....30%
Covert Saddlery Works.....60&5%

### Rules—

*Boxwood*.....60¢&10@60¢&10¢&5%
*Ivory*.....35¢&10@35¢&10¢&5%
Chapin-Stephens Co.:
Boxwood.....60@60&10%
Ivory.....35@35&10&10%
Miscellaneous.....50@50&10&10%
Combination.....55@55&10%
Stationers'.....10@10&10%
Lufkin's Steel.....50&10%
Lufkin's Lumber.....60&10%
Stanley R. & L. Co.:
Boxwood.....60@60&10%
Ivory.....35@35&10&10%
Union Nut Co.:
Boxwood.....60@60&10%
Ivory.....35&10@35&10&10%

### Sash Locks—See *Locks, Sash.*

### Sash Weights—

See *Weights, Sash.*

### Sausage Stuffers or Fillers

—See *Stuffers or Fillers, Sausage.*

### Saw Frames—See *Frames, Saw*

### Saw Sets—See *Sets, Saw.*

### Saw Tools—See *Tools, Saw.*

### Saws—

Atkins:
Circular.....50@50&10%
Band.....50&10@60%
Cross Cuts.....35&5%
Mulay, Mill and Drag.....50&10%
One-Man Saw.....40%
Wood Saws.....40%
Hand, Compass, &c.....40%
Chapin-Stephens Co.:
Turning Saws and Frames..30@30&10%
Diamond Saw & Stamping Works:
Sterling Kitchen Saws.....25%
Disston's:
Circular, Solid and Inserted Tooth..50%
Band, 3 to 14 in. wide.....60%
Band, ⅛ to 2¾.....70%
Crosscuts.....45%
Narrow Crosscuts.....50%
Mulay, Mill and Drag.....50%
Framed Woodsaws.....35%
Woodsaw Blades.....35%
Woodsaw Rods.....25%
Hand Saws, Nos. 12, 99, 9, 16, d100, D8, 120, 78, 77, 8.....25%
Hand Saws, Nos. 7, 107, 107½, 3, 1, 0, 00, Combination.....30%
Compass, Keyhole, &c.....25%
Butcher Saws and Blades.....35%
C. E. Jennings & Co.'s:
Back Saws.....25&10%
Butcher Saws.....30 &10%
Compass and Key Hole Saws.35&5&10%
Framed Wood Saws.....30&10%
Hand Saws.....20&2½&10%
Wood Saw Blades.....30&10%
Millers Falls:
Butcher Saws.....15&10%
Star Saw Blades.....15&10%
Peace:
Circular and Mill.....50%
Cross Cuts, list Jan. 1, '99.....50%
Hand, Panel and Rip.....30%
Richardson:
Circular and Mill.....50%
Hand, &c.....30%
X Cuts, list Jan. 1, '99.....50%
Simonds':
Circular Saws.....50%
Crescent Ground Cross Cut Saws..35%
One-Man Cross Cuts.....40&10%
Gang Mill, Mulay and Drag Saws..50%
Band Saws.....50%
Back Saws.....25@25&7½%
Butcher Saws.....35@35&7½%
Hand Saws.....25@25&7½%
Hand Saws, Bay State Brand.....45%
Compass, Keyhole, &c.....25@25&7½%
Wood Saws.....35@35&7½%

### Hack Saws—

Atkins' Hack Saw Blades A A A.....30%
Disston:
Concave Blades.....25%
Keystone.....40%
Hack Saw Frames.....30%
Fitchburg File Works, The Best.....25%
C. E. Jennings & Co.'s:
Hack Saw Frames, Nos. 175, 180..... 35&5&10%
Hack Saws, Nos. 175, 180, complete. 35&5&10%
Griffin's Hack Saw Frames...35&5&10%
Griffin's Hack Saw Blades.....35&5&10%
Star Hack Saws and Blades.....15&10%
Sterling Hack Saw Blades.....25%
Sterling Hack Saw Frames.....20%

### Scroll—

Barnes' No. 7, $15.....25%
Barnes' Scroll Saw Blades.....40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20.....20%
Lester, complete, $10.00.....15&10%
Rogers, complete, $4.00.....15&10%

### Scalers, Fish—

Bishop's Lightning.....₱ doz. $3.00
Covert's Saddlery Works.....60&10%

### Scales—

*Family, Turnbull's.....30@30&10%*
*Counter:*
*Hatch, Platform, ½ oz to 8 lbs. doz. $5.50*
*Two Platforms, ½ oz to 8 lbs. doz. $16*
*Union Platform, Plain...$1.70@1.90*
*Union Platform, Striped $1.85@2.15*
Chatillon's:
Eureka.....25%
Favorite.....40%
Grocers' Trip Scales.....50%
Pelouze Scales—Household, Counter, Candy, Ice, Postal, Computing.....50%
"The Standard" Portables.....45%
"The Standard" R. R. and Wagon.....50%

### Scrapers—

*Box, 1 Handle.....doz. $2.25@2.50*
*Box, 2 Handle.....doz. $3.00@3.50*
*Ship Light, $2.50; Heavy, $4.00*
Adjustable Box Scraper (S. R. & L. Co.) $6.00.....30@30&10%
Chapin-Stephens Co., Box.....50@50&10%

### Screens, Window, and Frames—

Flyer Pattern Window Screen...60@60&5%
Maine Window Screen Frames...40&10&5%
Perfection Window Screens.....60@60&5%
Phillips' Window Screen Frames....60&5%
Porter's:
Fairview Window Screens..... 60&5@60&5&2½%
Hummer Window Screens..... 60&5@60&5&2½%
Klondike Window Screens..... 60&5@60&5&2½%
See also *Doors.*

### Screws—Bench and Hand—

*Bench, Iron..doz. 1 in.. $2.75@3.00 : 1¼, $3.25@3.50 : 1¼, $3.85@4.25*
*Bench, Wood, Beech..doz. $3.00@3.50*
*Hand, Wood.....30@30&5%*
R. Bliss Mfg. Co, Hand.....30%
Chapin-Stephens Co., Hand.....30@30&10%

### Coach, Lag and Hand Rail—

*Lag, Common Point, list Oct. 1, '99.....70&15@...%*
*Coach and Lag, Gimlet Point, list Oct. 1, '99.....70&10@...%*
*Hand Rail, list Jan. 1, '81.60&10@...%*

### Jack Screws—

*Standard List.....75&10@80&5%*
Millers Falls.....50&10&10%
Millers Falls, Roller.....50&10%
P., S. & W.....50@50&10%
Sargent.....70&10%

### Machine—

*List Jan. 1, '98.*
*Flat or Round Head, Iron.50@50&10%*
*Flat or Round Head, Brass50@50&10%*

### Set and Cap—

*Set (Iron or Steel).....70%*
*Sq. Hd. Cap..*.....65%*
*Hex. Hd. Cap.....65%*
*Rd. or Fillister Hd. Cap.....60%*

### Wood—

*List Jan. 1, 1900.*
*Manufacturers' printed discounts :*
*Flat Head, Iron.....87½&10@...%*
*Round Head, Iron.....85&10@....%*
*Flat Head, Brass.....85&10@....%*
*Round Head, Brass..80&10@....%*
*Flat Head, Bronze....77½&10@...%*
*Round Head, Bronze.....75&10@...%*
*Drive Screws.....87½&10%*

### Scroll Saws—See *Saws, Scroll.*

### Scythes—

*Per doz.*
*Clipper Pattern, Grass...$4.50@$5.00*
*Full Polished Clipper.....$5.00@$5.50*
*Grain.....$7.00@$7.50*
*Clipper, Grain.....$7.75@$8.25*
*Wood and Bush.....$4.75@$5.00*

### Seeders— Raisin—

Enterprise.....25@30%

### Sets— Awl and Tool—

*Brad Awl and Tool Sets :*
*Wood Hdle., 10 Awls doz. $2.00@2.25*
*Wood Hdle., 14 Awls, 6 Tools doz. $2.50@2.60*
Aiken's Sets, Awl and Tools :
No. 20, ₩ doz. $10.00.....50&10&10%
Fray's Adj. Tool H'dls...Nos. 1, $12; 2, $18; 3, $12; 4, $9; 5, $7.....50%
C. E. Jennings & Co.'s Model Tool Holders.....30&10%
Millers Falls Adj. Tool H'dls, No. 1, $12; No. 4, $12; No. 5, $18 .... 15&10%
Stanley's Excelsior :
No. 1, $7.50; No. 2 $4.00; No. 3, $5.50.....30@30&10&10%

### Garden Tool Sets—

Ft. Madison, Three Pieces, Hoe, Rake and Shovel.....₩ doz. sets.....$9.00

### Nail—

*Square.....per gro. $2.25@2.50*
*Round, Blk. and Pol., assorted..... gro. $1.80@2.50*
*Octagon.....gro. $4.00@4.25*
*Knurled, Good.....gro. $5.75@6.00*
Buck Brothers.....27½%
Cannon's Diamond Point, ₩ gr. $12..25%
Mayhew's.....per gro. $9.00
Snell's Corrugated, Cup Pt. per gro. $7.50
Snell's Knurled, Cup Pt....per gro $7.50

### Rivet—

*Regular list.....70&10@75%*

### Saw—

Aiken's:
Genuine.....50&10%
Imitation.....50&10%
Atkin's :
Criterion.....40%
Adjustable.....40%
Bemis & Call Co's.:
Cross Cut.....30%
Hammer, new Pat.....45%
Plate.....20%
Spring Hammer.....30%
Disston's Star and Monarch.....25%
Morrill's No. 1, $15.00.....50%
Nos. 3 and 4, Cross Cut, $20.63.....50%
No. 5, Mill, $30.00.....50%
Nos. 10, 11, 9½, $15.63.....50%
No. 1 Old Style, $10.00.....50%
Giant Royal, Cross Cut .....₩ doz. $9.00
Royal Hand.....₩ doz. $5.40
Taintor Positive, ₩ doz. $18.....60%

### Sharpeners, Knife—

Chicago Wheel & Mfg. Co.....65%
Smith & Hemenway Co.....70%

### Shaves Spoke—

*Iron.....doz. $1.00@1.15*
*Wood.....doz. $1.65@2.25*
Bailey's (Stanley R. & L. Co.).....50@50&10&10%
Chapin-Stephens Co.....50@50&10&10%
Goodell's, ₩ doz. $9.00.....15&10%
Wood's F1 and F2.....50%

### Shears—

| *Cast Iron...* | *7* | *8* | *9 in.* |
|---|---|---|---|
| *Best* | *$16.00* | *18.00* | *20.00 gro.* |
| *Good* | *$13.00* | *15.00* | *17 00 gro.* |
| *Cheap* | *$5.00* | *6.00* | *7.00 gro.* |

*Straight Trimmers, &c.:*
*Best quality, Jap.....70@70&10%*
*" Nickel.....60@60&10%*
*Fair qual. Jap.....80@80&5%*
*" Nickel.....75@75&10%*
*Tailors' Shears.....40@40&10%*
Acme Cast Shears.....40@40&5%
Geneva.....60%
Heinisch's Tailors' Shears.....40%
Wilkinson's Hedge .....1900 list 45%
Wilkinson's Pruning.....40%
Wilkinson's Sheep .....1900 list. 25%

### Tinners' Snips—

*Steel Blades.....20&5@20&10*
*Steel Laid Blades.....40&10@50%*
Forged Handles, Steel Blades Berlin.....40@40&10%
Jennings & Griffin Mfg. Co.'s, 6¼ to 10 inch.....40&7½&10%
Niagara Snips.....40%
P., S. & W. Co.....20%

### Pruning Shears and Tools—

Cronk's Grape Shears.....33⅓%
Cronk's Pruning Shears.....33⅓%
Disston's Combined Pruning Hook and Saw, ₩ doz. $18.00.....25%
Disston's Pruning Hook, ₩ doz. $12.00.....25%
John T. Henry Mfg. Co.:
Pruning Shears, all grades.....40@40&5%
Orange Shears.....50&10@50&20%
Grape.....40&10@50%
Tree Pruners.....75%
P., S. & W. Co.....33⅓%

### Sheaves—Sliding Door—

Stowell's Anti-Friction .....50%
Patent Roller Hatfield's, Sargent's list.....70&10%
Reading.....70&10@75%
R. & E. list.....33⅓%
Sargent's list.....50&10%
Wrightsville Hatfield Pattern.....30%

### Sliding Shutter—

Reading list.....70&10@75%
R. & E. list.....33⅓%
Sargent's list.....50&10%

### Shells— Shells, Empty—

Brass Shells, Empty :
First quality, all gauges.....60&5%
Climax, Club, Rival, 10 and 12 gauge..65&5%
Paper Shells, Empty :
Acme, Ideal, Leader, New Rapid, Magic, 10, 12, 16 and 20 gauge..25&5%
Blue Rival, New Climax, Challenge, Monarch, Defiance, New Victor, Repeater, Yellow Rival, 10, 12, 16 and 20 gauge.....20%
Climax, Union, League, New Rival 10 and 12 gauge.....25%
Climax, Union, League, New Rival, 14, 16 and 20 gauge ($7.50 list)..20%
Expert, Metal Lined and Pigeon, 10, 12, 16 and 20 gauge.....33⅓&5%
Robin Hood, Low Brass.....20&10%
Robin Hood, High Brass.....30&10%

### Shells, Loaded—

*Loaded with Black Powder .....40%*
*Loaded with Smokeless Powder, medium grade.....40&5%*
*Loaded with Smokeless Powder, high grade.....40&10&10%*
Robin Hood, Low Brass.....50%
Robin Hood, High Brass.....50&10&5%

### Shoes Horse, Mule, &c.—

*F. o. b., Pittsburg:*
*Iron.....per keg $3.85*
*Steel.....per keg 3.60*
Burden's, all sizes, ₩ keg.....$3.90

### Shot—

*Drop, up to B, 25-lb. bag.....$1.40*
*Drop, B and larger, per 25-lb. bag $1.65*
*Buck, 25-lb. bag.....$1.65*
*Chilled, 25-lb. bag.....$1.85*
*Dust Shot, 25-lb. bag.....$2.00*

### Shovels and Spades—

*Association List, Nov. 15, 1902....40%*

### Sieves and Sifters—

*Hunter's Imitation..gro. $11.00@11.50*
Buffalo Metallic Blued, S. S. & Co., ₩ gr.:

| 14&16 | 16&18 | 18&20 |
|---|---|---|
| $12.90 | $13.80 | $15.00 |

National Mfg. Co.:

| | |
|---|---|
| Victor | per gro. $12.00 |
| Surprise | per gro. $11.00 |
| No Name | per gro. $11 00 |

Shaker (Barler's Pat.) Flour Sifters. ₩ doz., $2.00.....20%

### Sieves, Tin Rim—

*Per dozen.*

| *Mesh* | *14* | *16* | *18* | *20* |
|---|---|---|---|---|
| *Black, full size* | *$1.20* | *1.25* | *1.30* | *1.35* |
| *Plated, full size* | *$1.30* | *1.35* | *1.40* | *1.45* |
| *Black, scant* | | *$0.95* | *1.00* | *1.05* |

### Sieves, Wooden Rim—

*Nested, 10, 11 and 12 Inch.*
*Mesh 18, Nested, doz.....$0.65@0 75*
*Mesh 20, Nested, doz..... .75@ .85*
*Mesh 24, Nested, doz..... .90@1.00*

### Sinks—

Cast Iron—

*Standard list.....60@60&10%*
NOTE.—*There is not entire uniformity lists used by jobbers.*

### Skeins Wagon—

*Cast Iron.....70@70&10%*
*Malleable Iron.....40&10@50%*
*Steel.....40@40&10%*

### Slates, School—

*Factory Shipments.*
*"D" Slates.....45%*
*Noiseless Slates.....60&4 tens &5%*
*Wire Bound.....40%*

### Slaw Cutters—See *Cutters.*

### Slicers, Vegetable—

Sterling No, 10, $2.00.....33⅓

### Snaps, Harness—

*German.....40@40&10%*
Covert Mfg. Co.:
Deroy.....30&5&2%
High Grade.....45%
Jockey.....30&10%
Trojan.....45%
Yankee.....30&5&2%
Yankee, Roller.....30&5&2%
Covert's Saddlery Works:
Crown.....60%
German.....60%
Model.....60%
Triumph.....60%
Oneida Community :
Solid Steel.....60&5%
Solid Swivel.....60%
Sargent's Patent Guarded .....60%&10%

### Snaths—

*Scythe.....50@50&10%*

### Snips, Tinners'—See *Shears.*

### Spoons and Forks—

Silver Plated—

*Good Quality.....50&10@60&10&5%*
*Cheap.....40@60&10%*
International Silver Co.
1847 Rogers Bros. and Rogers & Hamilton.....40&10%
Rogers & Bro., William Rogers Eagle Brand.....50&10%
Anchor, Rogers Brand.....60%
Wm. Rogers & Son.....60&10%
Simeon L. & Geo. H. Rogers Co.:
Silver Plated Flat Ware.....60%
No. 77 Silver Plated Ware.....60&10%

### Miscellaneous—

*German Silver.....60@60&10%*
Cattaraugus Cutlery Co.:
Yukon Silver.....50%
Simeon L. & Geo. H. Rogers Co.:
German or Nickel Silver, Special list.....10&10%

### Tinned Iron—

*Teas.....per gro. 45@50c*
*Tables.....per gro. 90c@$1.00*

### Springs— Door—

Gem (Coil).....20%
Star (Coil).....30%
Torrey's Rod, 30 in.....₩ doz. $1.10
Victor (Coil).....50&10&10%

### Carriage, Wagon, &c.

*1¼ in. and Wider :*
*Black or ⅛ Bright, lb.....5¼c*
*Bright, lb.....5½c*
*Painted Seat Springs :*
*1½ x 22 x 26, per pr.....50@55c*
*1½ x 2 x 28 per pr.....60@65c*
*1½ x 3 x 28 and narrower, per pr. 80@85c*

### Sprinklers, Lawn—

Enterprise.....25@30%
Macksey.....₩ doz. $1.80
Philadelphia No. 1, ₩ doz. $12; No. 2, $15; No. 3, $24.....30%

### Squares—

*Nickel plated.....* } *List Jan. 5, 1900.*
*Steel and Iron.....* } .....70&10%
*Rosewood Hdl Try Square and T-Bevels .....60&10@10@70%*
*Iron Hdl. Try Squares and T-Bevels. 40&10@40&10@10%*
Disston's Try Sq. and T-Bevels.....70%
Winterbottom's Try and Miter.....40&10@40&10&10%

### Squeezers— Lemon—

*Wood, Common, gro., No. 0, $5.25 @$5.50 : No. 1. $6.25@$6.50.*
*Wood, Porcelain Lined.*
*Cheap.....doz. $2.00@2.75*
*Good Grade.....doz. $3.00@3.50*
*Tinned Iron.....doz. $0.75@1.25*
*Iron, Porcelain Lined doz. $2.90@3.25*

### Staples—

*Barbed Blind.....lb. 6@6½c*
*Electricians', Association list..... 80&10&10&10%*
*Fence Staples, See Trade Report.*
*Galvanized, 10c less than Barb Wire Polished. 20c less than Barb Wire.*
*Poultry Netting, Staples....per lb.. 8¼@8½c*
Grand Crossing Tack Co.'s list....80&10%

### Steels, Butchers'—

Dick's.....30%
Foster Bros'.....30%
Hartzell Cutlery Co.....40&5%
C. & A. Hoffmann's.....40%

### Steelyards.....25&10@30&10%

### Stocks and Dies—

*Blacksmiths'.....40&10@50%*
Curtis Reversible Ratchet Die Stock.25%
Derby Screw Plates.....25%
Gardner Die Stocks No. 1.....50%
Gardner Die Stocks, larger sizes.....40%
Green River.....25%
Lightning Screw Plate.....25%
Little Giant.....25%
Reece's New Screw Plates.....25@30%

### Stone—

Scythe Stones—

Chicago Wheel & Mfg. Co:
Gem Corundum, 10 inch, $8.00 per gro., 12 inch, $10.50
Pike Mfg. Co. 1901 list:
Black Diamond S. S....₩ gro. $12.00
Lamoille S. S.....₩ gro. $11.00
White Mountain S. S....₩ gro. $9.00
Green Mountain S. S....₩ gro. $6.00
Extra Indian Pond S. S.₩ gro. $7.50
No. 1 Indian Pond S. S..₩ gro. $7.00
No. 2 Indian Pond S. S..₩ gro. $4.50
Leader Red End S. S....₩ gro $4.50
Balance of 1901 list 33⅓%

Oil Stones, &c.

Chicago Wheel & Mfg. Co., 1901 list:
Gem Corundum Oil, Double Grit.....50%
Gem Corundum Axe, Single or Double Grit.....55%
Gem Corundum Slips.....55%
Gem Corundum Razor Hones.....50%
Pike Mfg. Co. 1901 list:

| | ₩ lb. |
|---|---|
| Arkansas Stone, No. 1, 3 to 5¼ in. | $2.80 |
| Arkansas Stone, No. 1, 5¼ to 8 in. | 3.50 |
| Arkansas Slips No. 1..... | $4.00 |
| Lily White Washita 4 to 8 in | 60¢ |
| Rosy Red Washita, 4 to 8 in | 60¢ |
| Washita Stone, Extra, 4 to 8 in.. | 50¢ |
| Washita Stone, No. 1, 4 to 8 in.. | 40¢ |
| Washita Stone, No. 2, 4 to 8 in.. | 30¢ |
| Lily White Slips..... | 90¢ |
| Rosy Red Slips..... | 90¢ |
| Washita Slips, Extra..... | 80¢ |
| Washita Slips, No. 1..... | 70¢ |
| India Oil Stones (entire list) ..... | 33⅓% |

| | |
|---|---|
| Hindostan No. 1, Regular.... | ₩ lb 8¢ |
| Hindostan No. 1 Small..... | ₩ lb 10¢ |
| Axe Stones (all kinds) ..... | |
| Turkey Oil Stones, ex. 5 to 8 in. | ₩ lb 80¢ |
| Queer Creek Stones, 4 to 8 in.....20¢ | |
| Queer Creek Slips.....40¢ | |
| Sand Stone.....5¢ | |
| Belgian, German and Swaty Razor Hones..... | 50% |
| Natural Grit Carving Knife Hones, ₩ doz.....$3.00 | |
| Quick Edge Pocket Knife Hones, ₩ doz.....$2.40 | |
| Mounted Kitchen Sand Stone, ₩ doz.....$1.80 | |

### Stoners— Cherry—

Enterprise.....25@30%

### Stops Bench—

Millers Falls.....15&10%
Morrill's...₩ doz., No. 1, $10.00.....50%
Morrill's, No. 2, $12.50.....50%

### Door—

Chapin-Stephens Co.....60@60&10%

### Plane—

Chapin-Stephens Co.....20%

### Straps— Box—

Cary's Universal, case lots.....20@10%

### Hame—

Covert's Saddlery Works.....60&10%

### Stretchers, Carpet—

*Cast Iron, Steel Points...doz. 55@60c*
*Socket.....doz. $1.75*

### Stuffers Sausage—

Enterprise Mfg. Co.....25@25&7½%
National Specialty Mfg. Co., list Jan. 1, '97.....30%

### Supports, Perch—

Hoffman's Porch Supports....₩ doz. 25¢

### Sweepers, Carpet—

| National Sweeper Co.: | Per doz. |
|---|---|
| Marion, Roller Bearing, regular finishes, full Nickel | $24.00 |
| Marion Queen, Roller Bearing, Fancy Veneers, full Nickel | $27.00 |
| Monarch, Roller Bearing, Nickel | $22.00 |
| Monarch, Roller Bearing, Jap'ned | $20.00 |
| Marion Queen, Roller Bearing, Regular Finishes, full Nickel | $34.00 |
| Transparent, Roller Bearing, Plate Glass Top, Nickel | $32.00 |
| Monarch Extra, Roller Bearing, (17-inch case), Nickel | $36.00 |
| Monarch Extra, Roller Bearing (17-inch case), Japanned | $33.00 |
| Perpetual, Regular Bearings, Nickel | $20.00 |
| Perpetual, Regular Bearings, Jap. | $18.00 |

NOTE.—*Discount of 50c per dozen on three-dozen lots. Discount of $1 per dozen on five-dozen lots.*

### Tacks Brads, &c.—

*List Jan. 15, '99.*
*Carpet Tacks, American.....*
*90¢25¢&5@....%*
*American Cut Tacks.90¢20¢5@....%*
*Swedes Iron Tacks...90¢30¢5@....%*
*Swedes Upholsterers' Tacks..... 90¢45¢10¢5@....%*
*Gimp Tacks.....90¢45¢5@....%*
*Lace Tacks.....90¢40@....%*
*Trimmers' Tacks..90¢30¢10¢5@....%*
*Looking Glass Tacks....70¢10@....%*
*Bill Posters' and Railroad Tack.... 90¢45¢5@....%*
*Hungarian Nails...80¢10¢5@....%*
*Common and Patent Brads....80¢10%*
*Trunk and Clout Nails...80¢5@....%*

NOTE.—*The above prices are for Straight Weights.* An extra 5% is given Star Weights** and an extra 10¢5% on Standard Weights.****

### Miscellaneous—

*Double Point Tacks.....90 and 5 tens*
*Steel Wire Brads, E. & E. Mfg. Co.'s list.....50¢10@60%*
See also *Nails, Wire.*

### Tanks, Oil—

| | Each. |
|---|---|
| Emerald, S. S. & Co.....30-gal | $3.40 |
| Emerald, S. S. & Co.....60-gal., | $4.25 |
| Queen City S. S. & Co., 30-gal | $3.65 |
| Queen City S. S. & Co., 60-gal | $4.50 |

### Tapes Measuring—

*American Asses' Skin.....40¢10@50%*
*Patent Leather.....25@30&5%*
*Steel.....40@40&5%*
*Chesterman's.....25@25&5%*
Keuffel & Esser Co., Steel and Metallic, Lower list, 1899.....35%
Lufkin's Steel.....33⅓&35%
Lufkin's Metallic.....30@30&5%

### Teeth Harrow—

*Steel Harrow Teeth, plain or headed, ⅝ inch and larger. per 100 lbs..$3.00*

### Thermometers—

*Tin Case.....80¢10@80¢10¢5%*

### Ties, Bale—Steel Wire.

*Single Loop.....80@80¢10%*
*Improved, Monitor, Cross Head, Etc.....70%*

### Ties, Wall—

Cleveland Wire Spring Co.:
Galv. Steel 5-32 x 6¼ in. ₩ 1000..$10.00
Galv. Steel 5-32 x 8½ in. ₩ 1000..$11.00
Galv. Steel 5-32 x 11½ in ₩ 1000..$12.00
Galv. Steel 5-32 x 15½ in. ₩ 1000..$14.00

### Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

### Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

### Tips, Safety Pole—

Covert's Saddlery Works.....60&10%

### Tire Benders, Upsetters, &c.—See *Benders and Upsetters, Tire.*

### Tools—Coopers'—
L. & I. J. White ..... 20@20&5%

### Hay—
Myers' Hay Tools ..... 30%

### Saw—
Atkins' Cross Cut Saw Tools ..... 40%
Simonds' Improved ..... 33⅓%
Simonds' Crescent ..... 25%

### Ship—
L. & I. J. White ..... 25%

### Transom Lifters—
*See Lifters, Transom.*

### Traps—Fly—
*Balloon, Globe or Acme ..... doz. $1.15@1.25 ; gro. $11.50@12.00*
*Harper, Champion or Paragon ..... doz. $1.25@1.40 ; gro. $13.00@13 50*

### Game—
*Oneida Pattern ..... 80@30&5%*
Newhouse ..... 45@45&5%
Hawley & Norton ..... 65&5@65&10%
Victor (Oneida Pattern) ..... 75@75&5%
Star (Blake Pattern) ..... 60&5@60&10%

### Mouse and Rat—
*Mouse, Wood, Choker, doz. holes ..... 8½@9c*
*Mouse, Round or Square Wire ..... doz. 85@90c*
Marty French Rat and Mouse Traps (Genuine):
No. 1, Rat, Each $1.12½ ; ₱ doz. $12.00
No. 3, Rat, ₱ doz. $6.00; case of 50 $5.25 doz.
No. 3½, Rat, ₱ doz. $4.75; case of 72 $4.25 doz.
No. 4, Mouse, ₱ doz. $3.50; case of 7 $4.75 doz.
No. 5, Mouse, ₱ doz. $2.75; case of 150 $2.25
Schuyler's Rat Killer, No. 1, ₱ gr. $30.00
No. 2, ₱ gr. $30.00; Mouse, No. 3, $18.00 ..... 50%
J. M. Mast Mfg. Co.: Per gro.

| | Mouse. | Rat. |
|---|---|---|
| Blizzard ..... | No. 12, $3.00 | No. 1, $9 50 |
| Old Nick ..... | No. 30, 2.22 | No. 2, 8.40 |
| Joker ..... | No. 5, 2.10 | No. 3, 8.40 |

Imp'd Snap Shot, Mouse, per gro., 2 hole, $2 40.
Imp'd Snap Shot, Mouse, per gro., 4 hole, $4.20.

### Trimmers Spoke—
Bonney's Nos. 1 and 2 ..... 40%
Wood's R I. ..... 50%

### Trowels—
Disston Brick and Pointing ..... 30%
Disston Plastering ..... 25%
Disston "Standard Brand" and Garden Trowels ..... 35%
Kohler's Steel Garden Trowels, 5 in. ..... ₱ gro. $5.00
Kohler's Steel Garden Trowels, 6 in ..... ₱ gro. $6.00
Never-Break Steel Garden Trowels ..... gro. $6.00
Peace's Plastering ..... 30%
Rose Brick and Plastering ..... 25&5%
Woodrough & McParlin, Pl'st'ring ..... 25%

### Trucks, Warehouse, &c.—
B. & L. Block Co.:
New York Pattern ..... 50&10%
Western Pattern ..... 60&10%
Handy Trucks ..... per doz. $16.00
Grocery ..... per doz. $15.00
Daisy Stove Trucks, Improved pattern ₱ doz. $18.50
Model Stove Trucks ..... ₱ doz. $18.50

### Tubs, Wash—

| | No. 1 | 2 | 3 |
|---|---|---|---|
| *Galvanized, per doz.* | *$4.75* | *5 25* | *6.00* |

Galvanized Wash Tubs (S. S. & Co.):

| No. | 1 | 2 | 3 | 10 | 20 | 30 |
|---|---|---|---|---|---|---|
| Per doz. | $5.25 | 6.00 | 6.75 | 6.50 | 7.00 | 8.00 |

### Twine—Miscellaneous—

| *Flax Twine—* | *BC* | *B.* |
|---|---|---|
| *No. 9, ¼ and ½-lb. Balls* | *21½c* | *23½c* |
| *No. 12, ¼ and ½ lb. balls* | *17½c* | *19½c* |
| *No. 18, ¼ and ½-lb. Balls* | *15½c* | *17½c* |
| *No. 24, ¼ and ½-lb. Balls* | *15 c* | *17 c* |
| *No. 36, ¼ and ½-lb. Balls* | *14½c* | *16½c* |

*Chalk Line, Cotton, ½-lb Balls ..... 22@22½c*
*Cotton Mops, 6, 9, 12 and 15 lb. to doz ..... 8c*
*Cotton Wrapping 5 Balls to lb .. according to quality ..... 11c@17c*
*American 2-Ply Hemp, ¼ and ½-lb. Balls ..... 13@14c*
*American 3 Ply Hemp, 1-lb. Balls .. 13@14c*
*India 2-Ply Hemp, ¼ and ½-lb. Balls (Spring Twine) ..... 8c*
*India 3-Ply Hemp, 1-lb. Balls ..... 8c*
*India 3-Ply Hemp, 1¼-lb. Balls .. 7c*
*2, 3, 4 and 5-Ply Jute, ½-lb. Balls ... 8@9c*
*Mason Line, Linen, ½-lb. Balls ... 45c*
*No. 264 Mattress, ¼ and ½-lb. Balls 37c*
*Wool, 3 to 6 ply ..... 5@5½c*

### Binder—

| | *Cents per lb* |
|---|---|
| *Sisal* | *10¼* |
| *Standard* | *10¾* |
| *Standard Manila (550 ft.)* | *11* |
| *Manila (600 ft.)* | *12* |
| *Pure Manila (650 ft.)* | *12¾* |

*F. o. b. Eastern Mill. C arload lots ¼ cent less.*

## Vises—
*Solid Box ..... 50&10@50&10&5*

### Parallel—
Athol Machine Co.:
Simpson's Adjustable ..... 40%
Standard ..... 40%
Amateur ..... 25%
Bonney's ..... 40%
Columbian Hdw. Co ..... 40%
Emmert Universal:
Pattern Makers' No. 1 ..... $15.00 net
Pattern Makers' No. 2 ..... $13.00 net
Machinist and Tool Makers' .$15.00 net
Fisher & Norris Double Screw ..... 15&10%
Hollands':
Machinists' ..... 40%
Keystone ..... 65&5%
Lewis Tool Co. ..... 20@30%
Merrill's ..... 20%
Miller's Falls ..... 50&10&15%
Parker's:
Victor ..... 20@25%
Regulars ..... 20@25%
Vulcan's ..... 40@45%
Combination Pipe ..... 55@60%
Prentiss ..... 20@25%
Sargent's ..... 40%
Smith & Hemenway Co.:
Machinists ..... 40%
Jewelers ..... 33⅓%
Snediker's X. L. ..... 33⅓%
Stephens' ..... 33⅓%

### Saw Filers'—
Bonney's, No. 1, $13; No. 3, $16 . 50&5%
Disston's D 3 Clamp and Guide, ₱ doz $30 ..... 25%
Reading ..... 60%
Wentworth's Rubber Jaw, Nos. 1, 2 and 3 ..... 45&50%

### Wood Workers'—
Wyman & Gordon's Quick Action, 6 in., $6.00 ; 9 in , $7.00 ; 14 in., $8.00.

### Miscellaneous—
Bignall & Keeler Combination Pipe Vise ..... 60%
Parker's Combination Pipe:
87 Series ..... 60%
187 Series ..... 60&5%
No. 870 ..... 40%

## Wads—Price Per M.

| | |
|---|---|
| *B. E., 11 up* | *60c* |
| *B. E., 9 and 10* | *70c* |
| *B. E., 8* | *80c* |
| *B. E., 7* | *80c* |
| *P. E., 11 up* | *$1.00* |
| *P. E., 9 and 10* | *1.25* |
| *P. E., 8* | *1.50* |
| *P. E., 7* | *1.50* |
| *Ely's B. E., 11 and larger* | *$1.70@1.75* |
| *Ely's P. E., 12 to 20* | *$3 00@3.25* |

Dis 15%

### Ware Hollow—
### Cast Iron, Hollow—
*Stove Hollow Ware:*
*Ground ..... 50@10@60%*
*Unground ..... 60@5@65%*
*White Enameled Ware:*
*Maslin Kettles ..... 70%*
*Covered Ware:*
*Tinned and Turned ..... 40%*
*Enameled ..... 50%*
*See also Pots Glue.*

### Enameled—
Agate Nickel Steel Ware, list Nov. 1, '01 ..... 50&10%
Iron Clad Ware ..... 70&10%
Lava, Enameled ..... 40&10%
Never Break Enameled ..... 50%

### Tea Kettles—
*Galvanized Tea Kettles:*

| | *6* | *7* | *8* | *9* |
|---|---|---|---|---|
| *Inch* | | | | |
| *Each* | *45c* | *50c* | *55c* | *65c* |

### Steel Hollow Ware.
Avery Spiders & Griddles ..... 65@65&5%
Avery Kettles ..... 60%
Porcelained ..... 50&5@50&10%
Never Break Spiders and Griddles ..... 65&5%
Never Break Kettles ..... 60%
Solid Steel Spiders & Griddles ..... 65&5%
Solid Steel Kettles ..... 60%

### Warmers, Foot—
Pike Mfg. Co., Soapstone ..... 40@40&10%

### Washboards—
Solid Zinc: ₱ doz
Crescent, family size, bent frame. $3.00
Red Star, family size, stationary protector ..... $3.00
Double Zinc Surface:
Saginaw Globe, family size, stationary protector ..... $2.85
Cable Cross, family size, stationary protector ..... $2.90
Single Zinc Surface:
Naiad, familysize, open back perforated ..... $2.40
Saginaw Globe, protector, family size, ventilated back ..... $2.25
Brass Surface:
Brass King, Single Surface, open back ..... $3.00
Nickel Plate Surface:
No. 1001 Nickel Plate, Single Surface $3.00

### Washers—
### Leather, Axle—
*Solid ..... 85c 10c@10@85c 10c 10c 10%*
*Patent ..... 85c@10@85c@20%*
*Coil:* ¼ 1 1¼ 1¾ *Inch.*
2c 10c 11c 13c *per 100*

### Iron or Steel—
*Size bolt ... 5-16 ⅜ ½ ⅝ ¾*
*Washers ... $6.80 5.90 4.60 4.40 4.20*
*In lots less than one keg add ½c per lb., 5-lb. boxes add ½c to list.*

### Cast Washers—
*Over ½ inch, barrel lots, per lb. ..... 1¾@2c*

### Wedges—
*Oil Finish ..... lb. 2.90@3.10c*

### Weights—
### Hitching—
Covert's Saddlery Works ..... 60&10%

### Sash—
*Per ton, f. o. b. factory:*
*Eastern District ..... $26.00*
*Western, Central and Southern Districts ..... $27.00*

### Wheels, Well—
*8-in., $1.6 @1.80; 10-in., $2.00@2.25; 12-in., $2.15@2.65; 14-in., $4.00@4.25*

### Wire and Wire Goods—
*Bright and Annealed:*
*6 to 9 ..... 72½&5@72½&10%*
*10 to 18 ..... 72½&10@72½&10&5%*
*19 to 26 ..... 75c 10c@2½@75c 10c 7½&5%*
*27 to 36 ..... 75c&10c@7½@80c@2½%*
*Galvanized:*
*6 to 18 ..... 70@70&5%*
*19 to 26 ..... 72½&5@72½&10%*
*27 to 36 ..... 72½&10@72½&10&5%*
*Coppered:*
*6 to 9 ..... 70&5@70&10%*
*10 to 18 ..... 70&10@70&10&5%*
*19 to 26 ..... 75c 5@75c 10c@2½%*
*27 to 36 ..... 75c&10@75c 10c&5%*
*Tinned:*
*6 to 14 ..... 75@75&7½%*
*15 to 18 ..... 72½&@72½%*
*19 to 26 ..... 70&5@70&5&5%*
*27 to 36 ..... 70@70&5%*
*Annealed Wire on Spools ... 70@70&5%*
*Brass and Copper Wire on Spools ... 60@60&5%*
*Brass, list Feb. 26, '96 ..... 30@30%*
*Copper, list Feb. 26, '96 ..... 15%*
*Cast Steel Wire ..... 50%*
*Stubs' Steel Wire ..... $6.00 to £. 40%*
Wire Clothes Line, see *Lines.*
Wire Picture Cord, see *Cord.*

### Bright Wire Goods—
*List April 1, 1901 ..... 85&10c&10@90%*

### Wire Cloth and Netting—
*Galvanized Wire Netting ..... 80@80&10%*
*Painted Screen Cloth per 100 ft. $1.15*
*Light Hardware Grade*
*2-8 Mesh, Plain (8c. list) sq. ft ... 1¾@2c*
*2-8 Mesh, Galv. (8c. list) sq. ft .. 2½@3¾c*

### Wire, Barb—See *Trade Report.*

### Wrenches—
*Agricultural ..... 80@80&10%*
*Baxter Pat'rn S Wrenches ..... 70&5@70&10%*
*Drop Forged S ..... 45@45&5%*
Acme ..... 60&10%
Alligator ..... 70%
Alligator Pattern ..... 70%
Bull Dog ..... 70%
Bemis & Call's:
Adjustable S ..... 35&5%
Adjustable S Pipe ..... 40%
Brigg's Pattern ..... 30&10%
Combination Black ..... 40&5%
Combination Bright ..... 40%
Cylinder or Gas Pipe ..... 55%
Extra Heavy ..... 45%
Merrick's Pattern ..... 50%
No. 3 Pipe, Bright ..... 55%
Boardman's ..... 33⅓%
Coes' Genuine ..... 40&10&5&5%
Coes' "Mechanics' ..... 40&10&10&5&5%
Donohue's Engineer ..... 40&10%
Dudly Auto ..... 50&5@50&10%
Eagle ..... 50&10%
Elgin Wrenches ..... 40%
Elgin Monkey Wrench Pipe Jaws ..... 33⅓%
Gem Pocket ..... 30%
Hercules ..... 70%
W. & B. Machinist:
Case lots ..... 50&10%
Less than case lots ..... 50&5%
Improved Pipe (W & B.) ..... 60%
Solid Handles, P. S. & W ..... 50@50&5%
Stillson ..... 65%
Triumph ..... 60&10%
Vulcan Chain ..... 50%

### Fruit Jar—
Triumph Fruit Can Wrenches, ₱ gro. $19.20
Syrup Cap Wrenches ..... ₱ gro. $8.00
T & B Fruit Jar Wrenches, ₱ gro $16.50
T & B Fruit Jar Holders ₱ gro. $30.00

Dis 25%

### Wrought Goods—
*Staples, Hooks, &c., list March 17 '92 ..... 90@90c&5%*

### Yokes Neck—
Covert Saddlery Works, Trimmed ..... 75%
Covert Saddlery Works, Neck Yoke Centers ..... 70%

### Yokes, Ox, and Ox Bows—
Fort Madison's Farmers & Freighters' ..... list net

### Zinc—
*Sheet ..... lb 7 @7¼c*

# PAINTS, OILS AND COLORS—Wholesale Prices.

### White Lead, Zinc, &c.
Lead, English white, in Oil ..... 7 @ 9½
Lead, American White, in Oil:
Lots of 500 ℔ or over ..... @ 6¼
Lots less than 500 ℔ ..... @ 7¼
Lead, White, in oil, 25 ℔ tin pails, add to keg price ..... @ ½
Lead, White, in oil, 12½ ℔ tin pails, add to keg price ..... @ 1
Lead, White, in oil, 1 to 5 ℔ assorted tins, add to keg price ..... @ 1½
Lead, American, Terms: For lots 12 tons and over ½¢ rebate; and 2% for cash if paid in 15 days from date of invoice; for lots of 500 lbs. and over 2% for cash if paid in 15 days from date of invoice; for lots of less than 500 lbs. net.
Lead White, Dry in bbls ..... 5½@ 6¼
Zinc, American, dry ..... ₱ ℔ 4¾@ 4¾
Zinc, Paris, Red Seal, dry ..... @ 8½
Zinc, Paris, Green Seal, dry ..... @ 9½
Zinc, Antwerp Red Seal, dry ..... @ 7½
Zinc, Antwerp, Green Seal, dry .. @ 8½
Zinc, V. M. French, in Poppy Oil, Green Seal:
Lots of 1 ton and over ..... 12 @12½
Lots of less than 1 ton ..... 12¼@12¾
Zinc, V. M French, in Poppy Oil, Red Seal:
Lots of 1 ton and over ..... 10¾@11¼
Lots of less than 1 ton ..... 11@11½
Discounts.—V. M. French Zinc.—Discounts to buyers of 10 bbl. lots of one or assorted grades, 1%; 25 bbls., 2%; 50 bbls., 4%.

### Dry Colors.
Black, Carbon ..... ₱ ℔ 6 @ 8
Black, Drop, Amer ..... 4 @ 7
Black, Drop, Eng ..... 7 @15
Black, Ivory ..... 12 @21
Lamp, Com ..... 4½@ 6
Blue, Celestial ..... ₱ ℔ 4 @ 6
Blue, Chinese ..... 22 @32
Blue, Prussian ..... 27 @30
Blue, Ultramarine ..... 3½@15
Brown, Spanish ..... ½@ 1
Brown, Vandyke, Amer ..... 1¾@ 2
Brown, Vandyke, Foreign ..... 2½@ 3
Carmine, No. 40 ..... ₱ ℔ $2.00@2.50
Green, Chrome, ordinary ..... 3 @ 6
Green, Chrome, pure ..... 19 @26
Lead, Red, bbls. ½ bbls. and kegs:
Lots less than 500 ℔ or over ..... @ 6¾
Lots less than 500 ℔ ..... @ 7¼
Litharge, bbls. ½ bbls. and kegs:
Lots 500 ℔ or over ..... @ 6¾
Lots less than 500 ℔ ..... @ 7
Ocher, French Washed ..... 5 @ 7
Ocher, Dutch Washed ..... 5 @ 7
Ocher, American ..... ₱ ton $10.00@15.00
Orange Mineral, English ..... ₱ ℔ 8½@ 9½
Orange Mineral, French ..... 10½@11¼
Orange Mineral, German ..... 8½@9½
Orange Mineral, American ..... 8½@ 8½
Red, Indian, English ..... 4½@ 8½
Red, Indian, American ..... 3 @ 3¼
Red, Turkey, English ..... 4 @ 6
Red, Tuscan, English ..... 7 @10
Red, Venetian, Amer., ₱ 100 ℔ .. 50@1.50
Red Venetian, English, ₱ 100 ℔ 1.50@1 75
Sienna, Italian, Burnt and Powdered ..... ₱ ℔ 3½@ 7½
Sienna, Ital., Raw, Powd ..... 3½@ 7½
Sienna, American, Raw ..... 1½@ 2
Sienna, American, Burnt and Powdered ..... ₱ ℔ 1½@ 2
Talc, French ..... ₱ 100 ℔ $1.25@1.50
Talc, American ..... .90 @1.10
Terra Alba, French, ₱ 100 ℔ .. 95 @1.00
Terra Alba, English ..... .95 @1.00
Terra Alba, American No. 1 ..... .85 @85
Terra Alba, American No. 2 ..... .45 @50
Umber, Turkey, Bnt. & Pow. ₱ ℔ 2½@ 3½
Umber, Turkey, Raw & Powd. 2½@ 3½
Umber, Bnt. Amer ..... 1½@ 2
Umber, Raw, Amer ..... 1½@ 2
Yellow, Chrome ..... 11 @14
Vermilion, American Lead ..... 10 @40
Vermilion, Quicksilver, bulk ... @70
Vermilion, Quicksilver, bags ... @71
Vermilion, English, Import ... .80 @95
Vermilion, Chinese ..... .$1.05@1.20

### Colors in Oil.
Black, Lampblack ..... 12 @14
Blue, Chinese ..... 36 @40
Blue, Prussia ..... 32 @35
Blue, Ultramarine ..... 13 @16
Brown, Vandyke ..... 11 @14
Green, Chrome ..... 10 @15
Green, Paris ..... @24
Sienna, Raw ..... 12 @15
Sienna, Burnt ..... 14 @15
Umber, Raw ..... 11 @14
Umber, Burnt ..... 11 @14

### Miscellaneous.
Barytes, Foreign, ₱ ton ..... $19.00@21.00
Barytes, Amer. floated ..... 18.00@20.00
Barytes, Crude, No. 1 ..... 9.00@10.00
Chalk, in bulk ..... ₱ ton 3.00@3.25
Chalk, in bbls ..... ₱ 100 ℔ ..@ 35
China Clay, English ..... ₱ ton 10.50@17.00
Cobalt, Oxide ..... ₱ 100 ℔ 2.26@2.50
Whiting, Common ₱ 100 ℔ .48@ .55
Whiting, Gilders ..... .62@ .68
Whiting, extra Gilders' ..... .66@ .72

### Putty.
In bladders ..... 1¾@2¼
In bulk ..... 1½@2
In cans 1 ℔ to 5 ℔ ..... 2½@4¼
In cans 12½ ℔ to 25 ℔ ..... 1½@2¼

### Spirits Turpentine.
In Southern bbls ..... 49 @49½¢
In machine bbls ..... 49½@50 ¢

### Glue.
Cabinet ..... ₱ ℔ 11½@16
Extra White ..... 18 @23
French ..... 12 @40
Irish ..... 13½@16
Low Grade ..... 9 @12
Medium White ..... 14½@16½

### Animal, Fish and Vegetable Oils.
Linseed, City, raw ..... ₱ gal..44 @ 45
Linseed, City, boiled ..... 46 @49
Linseed, State and West'n, raw 42 @ ..
Linseed, raw Calcutta seed .... 75 @ ..
Lard, Prime ..... 81 @82
Lard, Extra No. 1 ..... 60 @62
Lard, No. 2 ..... 47 @48
Cotton-seed, Crude, f. o. b. mill .32 @36
Cotton-seed, Summer Yellow, prime ..... 43½@44
Cotton-seed, Summer Yellow, off grades ..... 38½@39
Sperm, Crude ..... @ ..
Sperm, Natural Spring ..... 67 @68
Sperm, Bleached Spring ..... 68 @69
Sperm, Natural Winter ..... 72 @74
Sperm, Bleached Winter ..... 75 @77
Tallow, Prime ..... 58 @60
Whale, Crude ..... @ ..
Whale, Natural Winter ..... 46 @47
Whale Bleached Winter ..... 48 @49
Menhaden, Brown, Strained .. 30 @31
Menhaden, Light Strained .... 32 @33
Menhaden, Bleached Winter. 34 @35
Menhaden, Ex Bleached Winter 36 @37
Cocoanut, Ceylon ..... 5½@ 6¾
Cocoanut, Cochin ..... 5¾@ 7
Cod, Domestic ..... 33 @37
Cod, Newfoundland ..... 34 @ 0
Red Strained ..... 46 @47
Red Saponified ..... ₱ ℔ 5½@ 5½
Olive, Italian, bbls ..... 54 @ 0
Neatsfoot, prime ..... 57 @58
Palm, prime, Lagos ..... ₱ ℔ 5½@ 6

### Mineral Oils.
Black, 20 gravity, 25@30 cold test ..... ₱ gal. 13 @14
Black, 20 gravity, 15cold test. 13½@14½
Black, Summer ..... 12½@13½
Cylinder, light filtered ..... 20 @21½
Cylinder, dark filtered ..... 18½@19½
Paraffine, 903-907 gravity ..... 15 @15½
Paraffine, 903 gravity ..... 14 @14½
Paraffine, 883 gravity ..... 11¾@12
Paraffine, red, No. 1 ..... 15 @15½
In small lots ½¢ advance.

# CURRENT METAL PRICES.

## MAY 13, 1903.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

## IRON AND STEEL—

### Bar Iron from Store—

Refined Iron:
1 to 1⅞ in. round and square ..... ₩ lb .... @2.20¢
1⅛ to 4 in. x ⅜ to 1 in. ..... ₩ lb .... @2.10¢
1⅛ to 4 in. x ¼ to 5-16 ..... ₩ lb .... @2.40¢
Rods—⅝ and 11-16 round and square. ₩ lb .... @2.40¢
Angles: Cts ₩ lb
3 in. x ¼ in. and larger ..... 2.35¢
3 in. x 3-16 in. and ⅛ in. ..... 2.60¢
1¼ to 2½ in. x ⅛ in. ..... 2.40¢
1¼ to 2¾ in. x 3-16 in. and thicker ..... 2.35¢
1 to 1¼ in. x 3-16 in. ..... 2.40¢
1 to 1¼ in. x ⅛ in. ..... 2.45¢
1⅛ x ⅛ in. ..... 2.60¢
¾ x ⅛ in. ..... 2.70¢
⅝ x ⅛ in. ..... 3.50¢
⅝ x ⅛ in. ..... 4.00¢
¼ x 3-32 in. ..... 2.80¢
Tees:
1 in. ..... 2.60¢
1¼ in. ..... 2.50¢
1¼ in. and larger ..... 2.35¢
Beams ..... 2.50@3.00¢
Channels, 3 in. and larger ..... 2.50@3.00¢
Bands—1¼ to 6 x 3-16 to No. 8 ..... ₩ lb 2.40¢
"Burden's Best" Iron, base price ..... ₩ lb 3.30¢
Burden's "H. B & S. Iron, base price ..... ₩ lb 3.10¢
"Ulster" ..... ₩ lb 3.15¢
Norway Bars ..... 3.75@4.25¢
Norway Shapes ..... 4.00@4.50¢

### Merchant Steel from Store—

per lb
Bessemer Machinery ..... 2.10¢
Toe Calk, Tire and Sleigh Shoe ..... 2.30@3.00¢
Best Cast Steel, base price in small lots ..... 7¢

### Soft Steel Sheets—

| | | | |
|---|---|---|---|
| ¼ inch | 2.50¢ | No. 14 | 2.70¢ |
| 3-16 inch | 2.50¢ | No. 16 | 2.80¢ |
| No. 8 | 2.50¢ | No. 18 | 3.00¢ |
| No. 10 | 2.50¢ | No. 20 | 3.00¢ |
| No. 12 | 2.60¢ | No. 22 | 3.10¢ |

### Sheet Iron from Store.

#### Black.

| | One Pass, C. R. Soft Steel | G. R. Cleaned. |
|---|---|---|
| Nos. 14 to 16 | ₩ lb 2.90 | 3.0 ¢ |
| Nos. 18 to 21 | ₩ lb 3.00 | 3.10¢ |
| Nos. 22 to 24 | ₩ lb 3.10 | 3.2 ¢ |
| Nos. 25 and 26 | ₩ lb, 3.20 | 3.30¢ |
| No. 27 | ₩ lb, 3.30 | 3.40¢ |
| No. 28 | ₩ lb, 3.40 | 3.50¢ |

#### Russia, Planished, &c.

Genuine Russia, according to assortment ..... ₩ lb 11½@14¢
Patent Planished ..... ₩ lb A, 10¢; B, 9¢, net.

#### Galvanized.

Nos. 14 to 16 ..... ₩ lb, 3.24¢
Nos. 18 to 20 ..... ₩ lb, 3.51¢
Nos. 22 to 24 ..... ₩ lb, 3.78¢
No. 26 ..... ₩ lb, 4.05¢
No. 27 ..... ₩ lb, 4.32¢
No. 28 ..... ₩ lb, 4.59¢
No. 30 ..... ₩ lb, 5.67¢
No. 20 and lighter, 36 inches wide, 25¢ higher.

### Foreign Steel from Store—

Best Cast ..... ₩ lb 15 ¢
Extra Cast ..... ₩ lb 18 @ 20 ¢
Swaged, Cast ..... ₩ lb 16 ¢
Best Double Shear ..... ₩ lb 15 ¢
Blister, 1st quality ..... ₩ lb 13 ¢
German Steel, Best ..... ₩ lb 10 ¢
2d quality ..... ₩ lb 9 ¢
3d quality ..... ₩ lb 8 ¢
Sheet Cast Steel, 1st quality ..... ₩ lb 15 ¢
2d quality ..... ₩ lb 14 ¢
3d quality ..... ₩ lb, 12 ¢
R. Mushet's "Special" ..... ₩ lb 46 ¢
" " " Annealed ..... ₩ lb 75 ¢
" " "Titanic" ..... ₩ lb 19 ¢
Hobson's Choice XX Extra Best ..... ₩ lb 35 ¢
Jessop Self Hardening ..... ₩ lb 45 ¢
Seamans' "Nelson" Steel ..... 40 ¢
Hobson's "Soho" Special Self-Hardening ..... ₩ lb 43 ¢

## METALS—

### Tin—

Duty.—Pigs, Bars and Block. Free.

| | Per lb |
|---|---|
| Banca, Pigs | 31 @31½¢ |
| Straits, Pigs | 31 @31½¢ |
| Straits in Bars | 31½@32 ¢ |

### Tin Plates—

#### American Charcoal Plates.

Calland Grade:
IC, 14 x 20 ..... $6.75
IX, 14 x 20 ..... 8.25
Melyn Grade:
IC, 14 x 20 ..... 6.50
IX, 14 x 20 ..... 7.75
Allaway Grade:
IC, 14 x 20 ..... 5.50
IX, 14 x 20 ..... 6.50

#### American Coke Plates—Bessemer—

IC, 14 x 20 .....108 lb ..... $4.70@4.80
IX, 14 x 20 ..... $ .00@6.25

#### American Terne Plates—

IC, 20 x 28 ..... $9.50
IX, 20 x 28 ..... $11.50

### Copper—

DUTY: Pig, Bar and Ingot and Old Copper free. Manufactured, 2½¢ ₩ lb.

#### Ingot—

Lake ..... 15¾¢
Casting ..... 15 ¢

### Sheet and Bolt—

March 12, 1903. Net.

Prices, in cents per pound. Sheet 30 x 60.

| Not wider than | Not longer than | And longer than | 64 oz. & over, 50 lb. sheet, 30 x 60 and heavier. | 32 oz. to 64 oz., 25 to 50 lb. | 24 oz., to 32 oz., 18¾ to 25 lb. | 16 oz. to 24 oz., 12½ to 18¾ lb. | 14 oz. and 15 oz., 11 to 12½ lb. | 12 oz. and 13 oz., 9⅜ to 11 lb. | 10 oz. and 11 oz., 7½ to 9⅜ lb. | 8 oz. and 9 oz., 6¼ to 7½ lb. | Lighter than 8 oz. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ins. | Ins. | Ins. | | | | | | | | | |
| 30 | 72 | ..... | 20 | 21 | 21 | 21 | 22 | 23 | 24 | 27 | 30 |
| 30 | 96 | 72 | 20 | 21 | 21 | 21 | 22 | 24 | 27 | 30 | |
| 30 | ..... | 96 | 20 | 21 | 21 | 21 | 23 | 27 | 30 | | |
| 36 | 72 | ..... | 20 | 21 | 21 | 21 | 23 | 25 | 28 | 31 | |
| 36 | 96 | 72 | 20 | 21 | 21 | 21 | 23 | 27 | 30 | | |
| 36 | 120 | 96 | 20 | 21 | 21 | 22 | 24 | | | | |
| 36 | ..... | 120 | 20 | 21 | 20 | 23 | | | | | |
| 48 | 72 | ..... | 20 | 21 | 20 | 23 | 25 | 28 | 31 | | |
| 48 | 96 | 72 | 20 | 21 | 20 | 24 | 26 | 29 | | | |
| 48 | 120 | 96 | 20 | 21 | 23 | 25 | 28 | | | | |
| 48 | ..... | 120 | 20 | 22 | 24 | 27 | | | | | |
| 60 | 72 | ..... | 20 | 21 | 22 | 24 | 27 | 32 | | | |
| 60 | 96 | 72 | 20 | 21 | 23 | 25 | 30 | | | | |
| 60 | 120 | 96 | 20 | 22 | 24 | 27 | | | | | |
| 60 | ..... | 120 | 21 | 23 | 25 | 29 | | | | | |
| 72 | 96 | ..... | 20 | 22 | 24 | 29 | | | | | |
| 72 | 120 | 96 | 20 | 23 | 26 | 31 | | | | | |
| 72 | ..... | 120 | 21 | 24 | 29 | | | | | | |
| 108 | 96 | ..... | 21 | 24 | 27 | | | | | | |
| 108 | 120 | 96 | 22 | 25 | 28 | | | | | | |
| 108 | ..... | 120 | 23 | 26 | 30 | | | | | | |
| wider than 108 | 120 | ..... | 24 | 27 | | | | | | | |
| | ..... | 120 | 25 | 26 | | | | | | | |

Rolled Round Copper, ⅜ inch diameter and over, ₩ lb 20¢.
Circles, Segments and Pattern Sheets, 3¢ ₩ lb advance over price of sheet Copper required to cut them from.
Cold or Hard Rolled Copper 14 oz. ₩ square foot and heavier, 1¢ ₩ lb over the foregoing prices.
Cold or Hard Rolled Copper, lighter than 14 oz. ₩ square foot, 2¢ ₩ lb over the foregoing prices.
All Polished Copper, 20 in. wide and under, 1¢ ₩ lb advance over the price for Cold Rolled Copper.
All Polished Copper, over 20 in. wide, 2¢ ₩ lb advance over the price for Cold Rolled Copper.

### Planished Copper—

1¢ ₩ lb more than Polished Copper.

### Copper Bottoms, Pits and Flats—

14 oz. to square foot and heavier, ₩ lb ..... 25¢
13 oz. and up to 14 oz. to square foot, ₩ lb ..... 26¢
10 oz. and up to 12 oz., ₩ lb ..... 27¢
Lighter than 10 oz., ₩ lb ..... 28¢
Circles less than 8 in. diameter, 2¢ ₩ lb additional
Circles over 13 in. diameter are not classed as Copper Bottoms.
Polished Copper Bottoms and Flats, 1¢ ₩ lb extra.

### Copper Wire—

Hard and Soft Drawn—B. & S. Gauge.
*List Feb. 20, 1901.*

| | | | |
|---|---|---|---|
| Nos. 0000 to 8 | 9 and 10 | | 11 and 12 |
| Base | ⅛¢ | | ⅛¢ ₩ lb adv. |
| Nos. 13 | 14 | 15 | 16 |
| ⅛¢ | ¼¢ | ¼ | 1⅛¢ ₩ lb adv. |
| Nos. 17 | 18 | 19 | 20 |
| 1⅛¢ | 2¢ | 2¼¢ | 2¾¢ ₩ lb adv |

### Seamless Brass Tubes—

Standard always Stubs' gauge, unless otherwise ordered.
Feb. 6, 1899. Net. Outside Diameter.

| Stubs' W. G. | B. & S. W. G. | ¼ | 5-16 | ⅜ | 7-16 | ½ | 9-16 | ⅝ | ¾ | ⅞ | 1 | 1¼ | 1½ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4-11 | 3- 9 | ... | ..... | ... | ..... | 33 | 31 | 30 | 29 | 28 | 27 | 25 | 24 |
| 12 | 10 | ... | ..... | 37 | 35 | 33 | 31 | 30 | 29 | 28 | 27 | 25 | 24 |
| 13 | 11 | ... | ..... | 37 | 35 | 33 | 31 | 30 | 29 | 28 | 27 | 25 | 24 |
| 14 | 12 | ... | 42 | 37 | 35 | 33 | 31 | 30 | 29 | 28 | 27 | 25 | 24 |
| 15 | 13 | ... | 42 | 38 | 36 | 33 | 32 | 31 | 30 | 30 | 28 | 26 | 25 |
| 16 | 14 | ... | 43 | 39 | 37 | 34 | 33 | 32 | 31 | 30 | 29 | 26 | 25 |
| 17 | 15 | ... | 44 | 40 | 38 | 35 | 34 | 33 | 32 | 31 | 30 | 27 | 26 |
| 18 | 16 | 51 | 46 | 42 | 39 | 36 | 35 | 34 | 32 | 31 | 30 | 28 | 27 |
| 19 | 17 | 60 | 47 | 41 | 40 | 37 | 36 | 35 | 34 | 33 | 32 | 30 | 29 |
| 20 | 18-19 | 64 | 49 | 44 | 41 | 39 | 38 | 37 | 36 | 35 | 34 | 32 | 31 |
| 21 | 20 | 66 | 51 | 46 | 43 | 41 | 40 | 39 | 38 | 37 | 36 | 35 | 34 |
| 22 | 21 | 71 | 56 | 49 | 44 | 43 | 41 | 40 | 39 | 38 | 37 | 37 | 36 |
| 23 | 22 | 76 | 61 | 50 | 46 | 44 | 43 | 42 | 41 | 40 | 39 | 39 | 39 |
| 24 | 23 | 81 | 66 | 53 | 48 | 46 | 45 | 44 | 43 | 41 | 40 | 40 | 41 |
| 25 | 24 | 86 | 71 | 56 | 51 | 49 | 47 | 46 | 45 | 43 | 43 | 44 | 45 |

Copper Bronze and Gilding Tube, 3¢ ₩ lb additional

### Iron Pipe Sizes—Brass

| ⅛ | ¼ | ⅜ | ½ | ¾ | 1 | 1¼ | 1½ | 2 | 2½ | 3 | 3½ | 4 | 4½ | 5 | 6 inch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 36 | 32 | 29 | 27 | 21 | 21 | 21 | 21 | 21 | 21 | 21 | 26 | 23 | 25 | 27 | 28¢₩lb |

Copper, Bronze or Gilding Tubes, 3¢ ₩ lb additional

### Brazed Brass Tubing.

(To No. 19, *inclusive.*) June 6, 1898.
Brown & Sharpe's gauge standard.

| | Per lb. |
|---|---|
| Plain Round Tube, ¼ in. up to 2 in. | $0.35 |
| " " ⅜ " " 2 " | .36 |
| " " ½ " " 2 " | .38 |
| " " 5-16 " " 2 " | .41 |
| " " ¼ " 5-16 " | .48 |
| " " 3-16 " ¼ " | .65 |
| " " ⅛ " 3-16 " | 1.00 |
| Smaller than ⅛ inch | Special |
| 2 inch to 3 inch, to No. 19, inclusive | .38 |
| 3 inch | .40 |
| Over 3 inch to 3½ inch, inclusive | .45 |
| Over 3½ inch | .50 |

Bronze and Copper, advance on Brass List, 3 cents.
Discount from list 5 ..... 25%

### Roll and Sheet Brass—

(*Brown & Sharpe Standard Gauge.*)

| Common High Brass Wider than and including | in. 2 12 | in. 12 14 | in. 14 16 | in. 16 18 | in. 18 20 | in. 20 22 | in. 22 24 | in. 24 26 |
|---|---|---|---|---|---|---|---|---|
| To No. 20 inclusive | .23 | .23 | .25 | .27 | .29 | .31 | .33 | .36 |
| Nos. 21 22, 23 and 24 | .22 | .24 | .26 | .28 | .30 | .32 | .34 | .37 |
| Nos. 25 and 26 | .23 | .24½ | .27 | .29 | .31 | .33 | .35 | .38 |
| Nos. 27 and 28 | .23 | .25 | .28 | .30 | .32 | .34 | .33 | .39 |

| Common High Brass. Wider than and including | in. 26 28 | in. 28 30 | in. 30 32 | in. 32 34 | in. 34 36 | in. 36 38 | in. 38 40 |
|---|---|---|---|---|---|---|---|
| To No. 20, inclusive | .39 | .42 | .46 | .50 | .55 | .60 | .65 * |
| Nos. 21, 22, 23 and 24 | .40 | .43 | .47 | .51 | .56 | .61 | .68 |
| Nos. 25 and 26 | .41 | .44 | .48 | .52 | .57 | .63 | .71 |
| Nos. 27 and 28 | .42 | .45 | .49 | .53 | .58 | .65 | .75 |

* Special prices not less than 80 cents.
Add ½¢ ₩ lb additional for each number thinner than Nos. 28 to 38 inclusive. Discount from List ..... 25%

### Wire in Coils.

List February 26, 1896.

| Brown & Sharpe's gauge the standard. | Com. high brass. | Low brass. | High bronze and copper |
|---|---|---|---|
| All Nos. to No. 10, inclusive | $0.23 | $0.27 | $0.28 |
| Above No. 10 to No. 16 | .23½ | .27½ | .28½ |
| No. 17 and No. 18 | .24 | .28 | .32 |
| No. 19 and No. 20 | .25 | .29 | .33 |
| No. 21 | .26 | .30 | .34 |
| No 22 | .27 | .31 | .35 |
| No. 23 | .28 | .32 | .36 |
| No. 24 | .30 | .34 | .38 |
| No. 25 | .32 | .36 | .40 |
| No. 26 | .35 | .39 | .43 |
| No. 27 | .38 | .42 | .46 |
| No. 28 | .42 | .46 | .51 |
| No. 29 | .45 | .49 | .54 |
| No. 30 | .48 | .52 | .62 |
| No. 31 | .51 | .55 | .67 |
| No. 32 | .55 | .59 | .73 |
| No. 33 | .59 | .63 | .82 |
| No. 34 | .64 | .68 | .95 |
| No. 35 | .70 | .74 | 1.30 |
| No. 36 | .76 | .80 | 1.50 |
| No. 37 | 1.00 | 1.04 | 1.70 |
| No. 38 | 1.30 | 1.34 | 2.00 |
| No. 39 | 2.00 | 2.00 | 3.25 |
| No. 40 | 2.60 | 2.60 | 5.75 |

Discount, Brass Wire, 25%; Copper Wire, Nar. List November 16, 96.
Spring Wire, 2¢ ₩ lb advance.

### Tobin Bronze—

Straight, but not turned, Rods, ⅝ to 3 in. diameter, ₩ lb, net ..... 19¢
Finished Piston Rods, ⅝ to 2½ in. diameter, ₩ lb net, 20¢
Other sizes and extreme lengths, special prices.

### Spelter—

Duty: In Blocks or Pigs, 1¢ ₩ lb
Western Spelter ..... 6@6¼¢

### Zinc.

Duty: Sheet, 2¢ ₩ lb.
600 lb casks ..... 7. 5¢ | Per lb ..... 8¢

### Lead.

Duty: Pigs and Bars and Old, 2½¢ ₩ lb. Pipe and Sheets, 2½¢ ₩ lb.
American Pig ..... 4¾@5¢
Bar ..... 5½@6¾¢
Pipe ..... 6¾¢ ..... 20% off
Tin Lined Pipe ..... 12½¢ ..... 20% off
Block Tin Pipe ..... 40¢ net
Sheet Lead ..... 7¾¢ ..... 20% off
Old Lead in exchange, 4¢ ₩ lb.

### Solder.

½ & ¼, guaranteed ..... 20 @20½¢
No. 1 ..... 17½@18 ¢
Prices of Solder indicated by private brand vary according to composition.

### Antimony—

Duty, ¾¢ ₩ lb.
Cookson ..... ₩ lb 8½@8¾¢
Hallett's ..... ₩ lb 7¾@7¾¢
U. S. ..... ₩ lb 7 @7¼¢

### Aluminum—

Duty: Crude, 8¢ ₩ lb. Plates, Sheets, Bars and Rods, 13¢ ₩ lb.
No. 1 Aluminum (guaranteed over 99% pure), in ingot for remelting:
Small lots ..... ₩ lb 37¢
100-lb lots ..... ₩ lb 35¢
No. 2 Aluminum (guaranteed to be over 90% pure), in ingots for remelting:
Small lots ..... ₩ lb 34¢
100-lb lots ..... ₩ lb 33¢
Aluminum Sheet, B. & S. gauge. 50 lb or more

| | 6-in. ₩ lb. | 14-in. ₩ lb. | 24-in. ₩ lb. |
|---|---|---|---|
| Wider than | | | |
| And including | 14-in. | 24-in. | 30-in. |
| Nos. 13 to 19 | $0.42 | $0.44 | $0.47 |
| No. 20 | .44 | .46 | .49 |
| Nos. 21 to 23 | .46 | .48 | .51 |
| No. 24 | .46 | .50 | .53 |
| No. 25 | .47 | .51 | .54 |
| No. 26 | .47 | .54 | .59 |
| No. 27 | .48 | .57 | .62 |
| No. 28 | .48 | .57 | .64 |
| No. 29 | .49 | .60 | .69 |
| No. 30 | .50 | .64 | .77 |

*Note.*—Lots of less than 50 lb 5¢ ₩ lb extra.
Aluminum Wire, B. & S. Gauge.

| | | | |
|---|---|---|---|
| Larger than No. 9 | ₩ lb 40¢ | No. 15 | ₩ lb 43¢ |
| No. 9 to No. 10 | ₩ lb 40½¢ | No. 17 | ₩ lb 50¢ |
| No. 11 | ₩ lb 41 ¢ | No. 18 | ₩ lb 55¢ |
| No 12 | ₩ lb 41½¢ | No. 19 | ₩ lb 60¢ |
| No. 13 | ₩ lb 42 ¢ | No. 20 | ₩ lb 65¢ |
| No 14 | ₩ lb 42½¢ | No. 21 | ₩ lb 80¢ |

### Old Metals.

*Dealers' Purchasing Prices Paid in New York.*

| | | |
|---|---|---|
| Heavy Copper | ₩ lb | 11½¢ |
| Light and Tinned Copper | ₩ lb | 10½¢ |
| Heavy Brass | ₩ lb | 8½¢ |
| Light Brass | ₩ lb | 6½¢ |
| Lead | ₩ lb | 3½¢ |
| Tea Lead | ₩ lb | 3½¢ |
| Zinc | ₩ lb | 4 ¢ |
| No. 1 Pewter | ₩ lb | 18½¢ |
| No. 2 Pewter | ₩ lb | 8½¢ |
| Pure Aluminum, Sheet | ₩ lb | 21¢ |
| Cast Aluminum | ₩ lb | 16¢ |
| Tin Plate Scrap | ₩ ton | $4 50@5 00 |
| Wrought Scrap Iron | ₩ gross ton | $18.00@18.50 |
| Heavy Cast Scrap | ₩ gross ton | $17.50@18.00 |
| Stove Plate Scrap | ₩ gross ton | $11.00@11.50 |
| Burnt Iron | ₩ gross ton | $10 00@10.50 |